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The Journal

OF

Nervous and Mental Disease

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ORIGINAL ARTICLES

TUMORS OF THE BRAIN SIMULATING EPIDEMIC ENCEPHALITIS AND INVOLVING THE THIRD VENTRICLE, THE FOURTH VENTRICLE, AND THE BASAL GANGLIA: REPORT OF THREE CASES

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Generally speaking, the same causes in nature produce the same effects, but epidemic encephalitis as a cause has produced effects new to the present generation. This has evoked an enthusiastic tendency to ascribe to it phenomena that had been produced by more familiar diseases. The more bizarre the clinical picture, the more ready one was to ascribe it to the new epidemic. Three cases of tumor of the brain came to our notice during the epidemic of encephalitis, and two, unfortunately, were wrongly diagnosed. An investigation of the factors involved in the mistaken diagnosis, with a discussion of the type of tumor producing such confusion of ideas, is the purpose of this paper.

In the three cases herein reported, the tumor was situated in the third ventricle, the fourth ventricle, and the basal ganglia respectively. The tumors were of rapid growth; two had an insidious onset.

Weisenberg, in 1910, endeavored to establish a syndrome for tumors of the third ventricle. The first two cases of the three groups described by him were of tumors which, by their position, produced general symptoms only. It is the third group of tumors involving the aqueduct of Sylvius and its surrounding structures to which he pays greatest attention. These tumors in the posterior part of the third ventricle tend to grow with the current of the cerebrospinal fluid and to pass from the third into the fourth ventricle. The syn-

drome in this case is paralysis of associated ocular movements upward, less commonly to either side and downward, ataxia of the cerebellar type, ptosis of the upper lids and protrusion of either one or both eyeballs, generally large pupils with impaired reactions, paresis of the limbs of one or both sides, and general symptoms of tumor. He did not consider mental symptoms as specific for that type of tumor, but as associated with the marked degree of hydrocephalus and due to the compression of the cerebral cortex against the skull. Mental symptoms, either marked mental deterioration or apathy and drowsiness, were, however, frequently present in his cases and these may come in intermittent attacks. In Pollock's case there was marked mental decline, commencing nine months before. The patient had a colloid cyst in the third ventricle occluding the foramen of Monro. MacPherson's case, in which mental deterioration had begun sixteen months before, was diagnosed cardiorenal psychosis. At necropsy an epidermoid papillary cystoma was found in the third ventricle.

Bassoe's patient had a disease bearing a striking resemblance to general paresis with mental deterioration nearly two years before death. This man had a small sessile tumor in the floor of the fourth ventricle, and his eye grounds had remained normal. Another patient in Bassoe's series, suffering also from tumor of the fourth ventricle, had a definite psychosis with delusions of persecution. Intermittent attacks of coma with normal periods intervening were characteristic in a case described by Galt. At necropsy a soft tumor the size of a walnut was found in the fourth ventricle.

Lowrey reported the case of a patient committed to an institution for the insane with a mistaken diagnosis of paresis. Necropsy showed a tumor filling the third and lateral ventricles, invading their walls and the corpus callosum. In most cases described by these authors there were few localizing signs and in the majority the cardinal signs of brain tumor were wanting. The accompanying psychosis, lethargy, or coma, increases the difficulty and these tumors are often missed. Tumors confined to the thalamus and the lenticular nucleus and situated bilaterally, as in Case 2 reported herein, are very rare. I have not been able to find a case in literature sufficiently similar to quote as comparison.

I find in the literature to date four cases wrongly diagnosed encephalitis which makes an interesting comparison with this series. At times the mechanism involved in a mistaken diagnosis is as interesting as the correct interpretation of signs and symptoms. Mor-

risson's patient, a woman aged thirty-two years, had a family history of alcoholism and mental degeneracy. She had been ill nine months and the onset of her trouble was characterized by headache, nausea, and vertigo. There were few essential signs of any but psychic disturbances until the end, and the fundi of the eyes remained normal. She had slow cerebration and was depressed. The most striking feature of her illness was the marked alternation of bright, cheerful, talkative periods and phases of depression, mental retardation, and catatonic stupor. She apparently comprehended questions during her catatonic periods, but would not reply, although in her lucid intervals she admitted she had appreciated her surroundings. Five months after the onset, Babinski's sign was positive in the left foot, but there was no other localizing evidence; temperature and spinal fluid remained normal throughout. In her stupor there was apparent comprehension, but viscosity of voluntary activity, typical of that seen in the lethargic patients with epidemic encephalitis. Necropsy showed multiple melanomas in the right temporal, left parietal, left occipital, and both frontal lobes of the brain.

Bassoe's patient, a woman aged fifty years, had an illness even more suggestive of encephalitis. She had an abrupt change of personality, became irritable, seclusive, and lacked self-confidence. She complained of frontal headaches, and later became confused and incoherent. Stupor gradually developed. There were no definite localizing signs until close to the end, when there developed a bilateral Babinski's sign and a ptosis of one eyelid. Examination of the spinal fluid showed ninety-eight lymphocytes, and Zone II Lange colloidal gold curve. Later the count reduced to five lymphocytes, but the leukocytes remained 13,400. Her temperature rose gradually to 100, to 101, and later to 103. She died in coma five months after the onset of symptoms. Necropsy showed a tumor that filled the third ventricle and projected into both lateral ventricles merging with the basal ganglia. All through the course of the patient's disease the picture had resembled that of an inflammatory process rather than that of a tumor, and in a few details her picture resembled that presented in Case 1.

Lenoble presented the case of a patient, aged fifty years, who for some months had been unusually drowsy and apathetic. Finally he became stuporous and died. The fundi of the eyes had remained normal and the cerebrospinal fluid had contained only four lymphocytes to the cubic millimeter. There were, however, large numbers of red corpuscles in the microscopic field, although the fluid had

apparently not been contaminated by local bleeding at the site of puncture. A diffuse gelatinous tumor of the right basal ganglion was found at necropsy and the membranes of the brain were hemorrhagic.

The combination of a slumbering glioma which had given no symptoms until hemorrhage with an epidemic encephalitis occurred in a patient whose case was reported by Howe. There was an initial convulsion and hemiplegia which cleared up, to be followed a few weeks later by drowsiness, somnolence, headache, and ptosis. The antemortem diagnosis was epidemic encephalitis and the postmortem

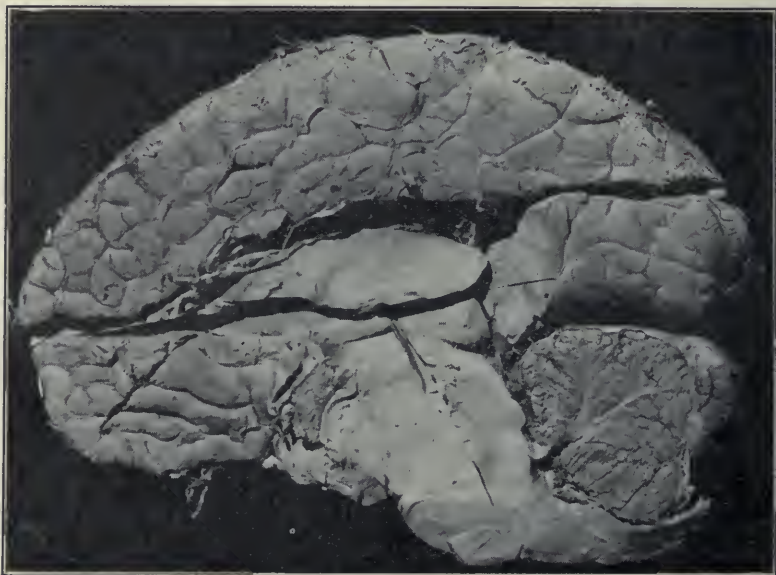


FIG. 1 (Case A317080). Vertical section of brain, somewhat to left of middle line. Ganglioneuroma (?) arising from floor of third ventricle and involving the ventricle, its walls, the midbrain, and pons.

findings were cerebral glioma in the central portion of the right cerebral hemisphere, and hemorrhagic encephalomyelitis.

These four patients had in common a progressive lethargic condition with few signs of a focal cerebral lesion. It is perhaps natural during an epidemic of a disease in which lethargy is a marked feature, that such a mistake should be made.

The same mistake was made in Case 1 of this series. The findings at necropsy were not more interesting than the progress of the disease from its initial abrupt onset till death in coma.

REPORT OF CASES

Case 1 (A317080). Mr. D. O., aged twenty-eight years, was brought to the Mayo Clinic May 25, 1920, complaining of failing vision and lethargy. He had had syphilis and in the fall of 1919 a mild attack of influenza. Eight months before, in the evening, he had experienced a severe sharp pain in the right eyeball and the next morning the right eyelid had drooped. Since then he had seen double. Five months before, his eyesight had begun to fail. Two months before, he had noticed a tendency for urine and feces to escape involuntarily. He had had some mild headaches. More recently his relatives had noticed a weakness of the lower part of the left side of his face. He had become weak, dull, and drowsy, and had to be hospitalized on this account.

The patient was a sleepy looking man with a pale, fat, flabby face, who answered all questions slowly, but intelligently. He had gained twenty pounds in weight during the previous twelve months. His blood pressure and pulse were normal, but his temperature was 99.6. Examination of the ear, nose, and throat revealed nothing of note except decreased bone conduction of sound. Urinalysis of a twenty-four hour specimen of 1850 c.c. showed a specific gravity of 1009 and no albumin, sugar, or pus. Hemoglobin was 76 per cent, and leukocytes numbered 8500. The Wassermann test on both blood and spinal fluid was negative. There was neither lymphocytosis nor increased globulin in the spinal fluid.

Vision in the right eye was 6/200; with the left eye the patient could only count fingers. There was marked ptosis of the left eyelid with a divergent strabismus of about 22 degrees. The right pupil was larger than the left and both reacted very slightly to light and accommodation. The optic nerve on the right had a slight suggestion of pallor on the temporal side; the left nerve head seemed perfectly normal. Perimetric fields were charted, and loss of red and green color vision and unreliability of blue were found. The form field seemed little altered considering the poor vision of the patient; blind spots in each field were enlarged.

Neurologic examination showed a complicated and diffuse picture. Interference with the functions of the second and third cranial nerves and weakness of the lower branches of the left seventh nerve have already been suggested; the other cranial nerves apparently were functioning normally. His left upper extremity and both lowers were weak and slow. He had marked Rombergism, but his gait, although slow and weak, was not unusually affected. The tendon reflexes were reduced in the upper limbs, and increased in the lower, but Babinski's sign was absent. He had trouble in controlling his sphincters, but there were no sensory changes. He had marked incoördination of his left arm and a slow, coarse, rhythmic tremor in that arm.

His temperature remained normal or one point above until the last week when it slowly ascended to 106. His pulse rate averaged 80 to 90 and his respirations 20. There was no polyuria and his

weight remained constant. His mental capacity was poor, but increased under stimuli; he was slow and drowsy, and coöperated poorly. While under observation he became more and more lethargic. He could be aroused at first and would answer intelligently, but gradually the lethargy passed into coma, his tremor became more violent, and he died six weeks from the time of his arrival, after nine months of illness.

Necropsy revealed a large infiltrating tumor of the brain which was seen before the brain was sectioned as a hard mass filling the interpeduncular fossa and encircling the stalk of the pituitary which

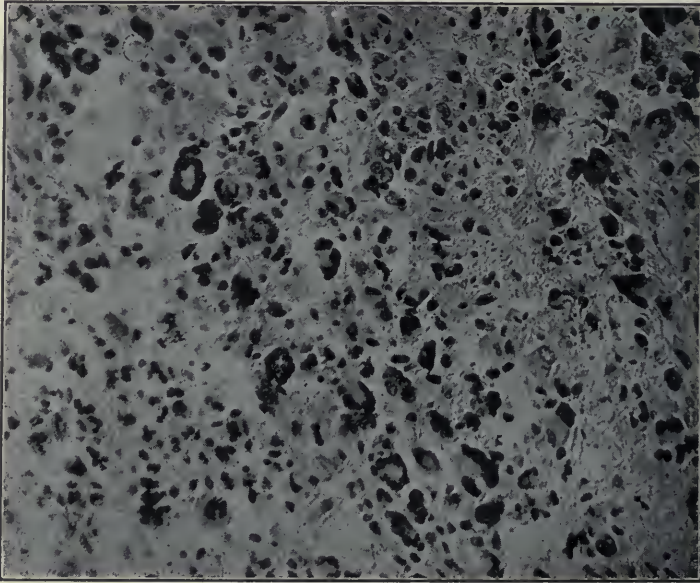


FIG. 2 (Case A317080). Large multinucleated cells with peripherally arranged nuclei. A few of the other cells show pyknosis and degeneration of nuclei ($\times 150$).

seemed macroscopically normal. On section of the brain antero-posteriorly, the tumor was seen to have grown up into the third ventricle and infiltrated both thalami and the base of the midbrain. It did not apparently involve the lamina quadrigemina or portion of the midbrain dorsal to the aqueduct of Sylvius. The tumor extended as far anteriorly as the lamina terminalis and as far superiorly as the tenia thalami. The fourth ventricle was free, but its floor was invaded by the posterior limits of the tumor which had invaded the pontine part of the floor. The optic tracts and chiasm were pushed forward and flattened. Coronal and horizontal section of the brain showed that the lateral extension of the tumor was relatively small. The thalami were infiltrated, but the lenticular nuclei escaped and the capsule was apparently affected only by pressure. The tumor had

no definite margins and infiltrated the brain in a diffuse manner so that its limits were hard to estimate. There was marked hydrocephalus (Fig. 1).

The microscopic characteristics of the tumor were unusual. In a section containing a piece of normal brain tissue invaded by tumor tissue the cellular structure seemed of mixed type. Predominating in this section (Fig. 2) were large pale multinucleated bodies closely resembling giant cells, having from two to ten or more nuclei, all peripherally arranged and enclosing a homogeneous pale eosin-staining substance. The average diameter of these large cells was 25 to 30 microns, and scattered throughout was found an occasional



FIG. 3 (Case A359964). Coronal section of the brain showing involvement of basal ganglia greater on the right side.

huge cell in the interior of which was either a shapeless, deeply staining, solid chromatin mass, or a few scattered fragments of chromatin, suggesting disintegrating nuclei. The remaining cells varied considerably in size and shape, from lymphocyte size to 15 to 20 microns. They were either round and regular with the cells almost filled with deeply staining nuclei or larger and pyramidal shaped with long processes suggesting ganglion cells, but containing no Nissel's granules or nucleoli. The smaller lymphocyte-like cells were arranged in clusters, but did not surround the blood vessels. In other portions of the section the cells were smaller and were more differentiated neurocytes. They resembled neuroglia, some having a fusiform shape with fine bundles of fibrils attached thereto. Occasional mitotic figures were found. The tumor tissue was stained by various methods

and it varied in appearance according to the region from which it was taken. The pituitary body was normal. Ganglioneuroma was strongly suggested, but further study was needed to substantiate this diagnosis.

Comment: Reviewed after death with all the history and findings arranged in order, the diagnosis of tumor seems clear. However, the patient arrived during the height of the epidemic of encephalitis with the characteristic ocular symptoms and lethargy, at that time considered the chief manifestations of the disease. He had little, how-

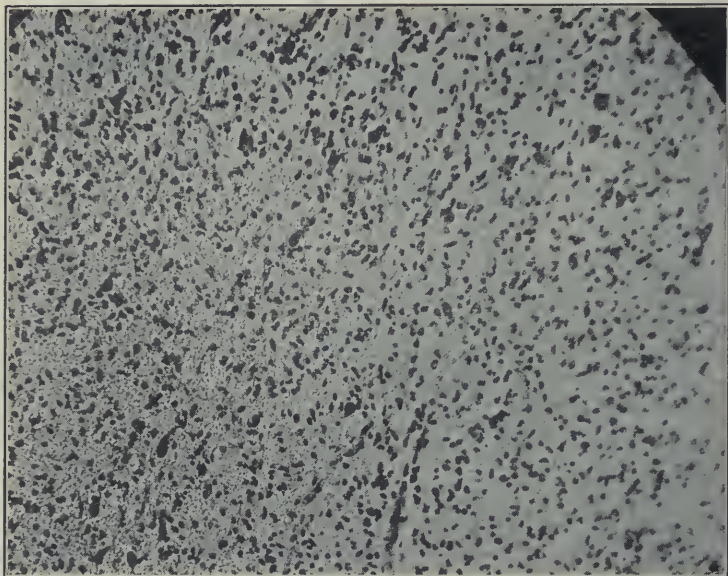


FIG. 4 (Case A359964). Glioma showing cellular structure with relatively dense intercellular fibrillae ($\times 100$).

ever, to support this diagnosis except his general lethargic appearance and the absence of the more usual signs of tumor. The changes in the fundi of his eyes were not in proportion to his loss of vision and the whole picture resembled some diffuse cerebral process with involvement of the spinal cord. The history of chancre only confused the diagnosis more. The character of the tumor was very unusual. In some respects it greatly resembled in histologic character that described by Christin and Naville and diagnosed as a ganglioneuroma. We were tempted to make such a diagnosis in this case, although this type is extremely rare.

Case 2 (A359964). A. W., a boy aged twelve years, was brought to the Clinic February 6, 1921. His chief complaints were weakness of the left side of the body, and difficulty in swallowing and speaking.

Four months before he had been skating and had become so chilled that he developed a cough and coryzal attack with slight fever which lasted about a week; his parents thought that he had not completely recovered from this at the time of examination. However,

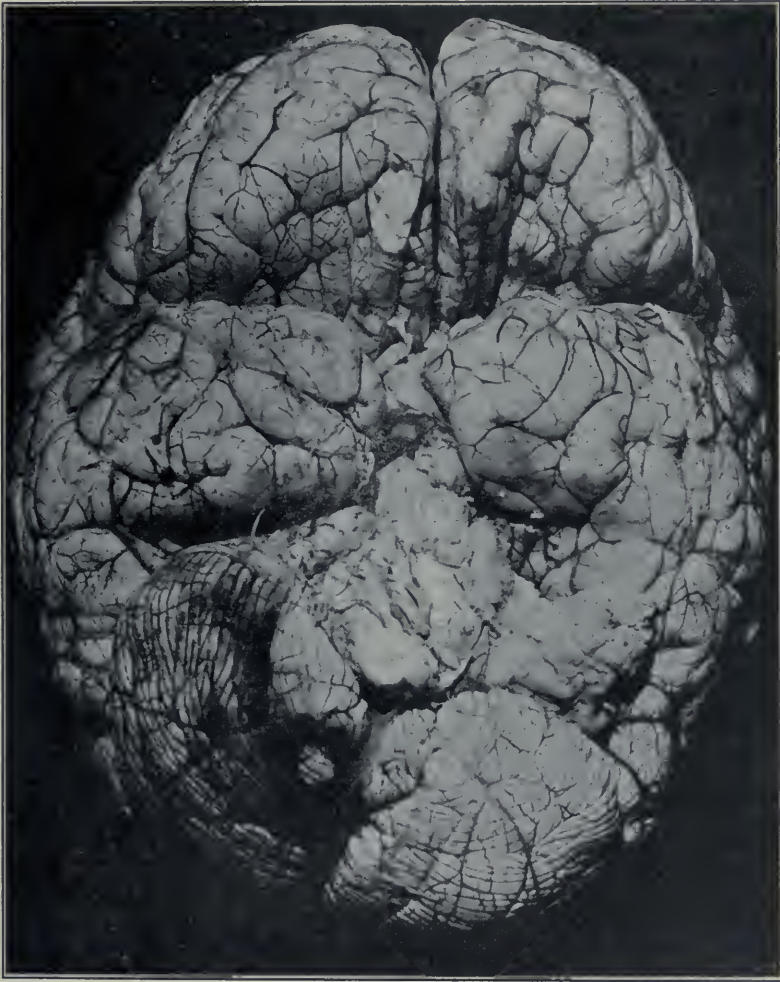


FIG. 5 (Case A361792). Basal surface of brain showing tumor emerging from left side of pons and filling cerebellopontile angle and interpeduncular fossa.

he returned to school after this week of illness and for a month nothing unusual was observed except slight weakness and slowness in action. Three months before, his gait had become somewhat shuffling and unsteady and his leg and arm stiff, slow, and clumsy. His face lost its usual expression and his speech became indistinct.

Finally he experienced difficulty in swallowing liquids, and he began to sleep more soundly and longer than usual. His left side was the more affected and his weight had increased. He had remained mentally alert in spite of his bodily slowness. At no time had he had vomiting, headache, diplopia, or any visual disturbance.

The boy was well nourished; he had a mask-like face, drooled saliva, and walked with the characteristic Parkinsonian slowness and stoop. Urinalysis and examinations of the blood and cerebrospinal fluid were negative. Vision and the fundi of the eyes were normal and pupillary reflexes were active; ocular movements were slow and incomplete and convergence was poor.

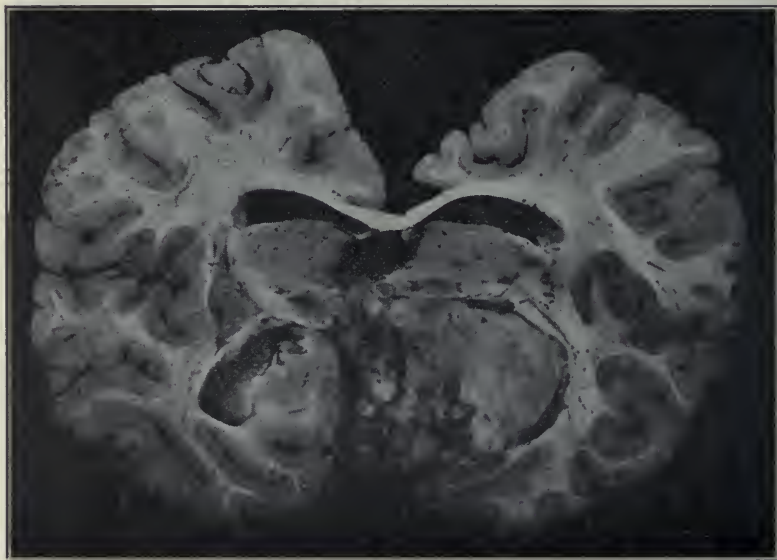


FIG. 6 (Case 361792). Coronal section of posterior surface of brain. Tumor pushing its way into inferior horn of left lateral ventricle. Ventricular walls in close apposition but lining membrane intact.

In addition to the stiff, slow Parkinsonian gait, posture and facies, already noted, the patient showed bilateral Babinski's sign and a marked choreo-athetosis on both sides, but greater on the left, like all his other disabilities. He had trouble in swallowing, but there was no sensory change whatever or astereognosis. Speech was slow, monotonous, and indistinct, although he was bright and intelligent and coöperated readily. The diagnosis was epidemic encephalitis.

At 4 p. m. the day after examination he suddenly lost consciousness, had a few convulsions, and died four hours later in coma. The spinal fluid was bloody. A superimposed hemorrhage was considered the immediate cause of death.

Necropsy revealed a hemorrhage into the ventricles, and a tumor in the brain. This was a diffuse infiltrating glioma involving both optic thalami, and the right lenticular nucleus. Part of the tumor projected into the right lateral ventricle near the foramen of Monro. It differed macroscopically very little from normal brain tissue, but it could be traced in sections as far anteriorly as the foramen of Monro, and posteriorly as far as the commencement of the inferior horn of the lateral ventricle. Inferiorly in the subthalamic region and floor of the third ventricle, it joined across the middle line. The



FIG. 7 (Case A361792). Horizontal section of cerebellum. Tumor in floor of fourth ventricle with central degeneration. Ventricle represented by a narrow cleft with intact ependymal lining.

right internal capsule and lenticular nucleus were distorted and the right optic thalamus was greatly enlarged (Fig. 3).

Microscopically the tumor was a cellular glioma with the cells in nests and clusters, not surrounding blood vessels. There was abundance of intercellular fibrillæ. Altogether there was nothing unusual about the type of tumor (Fig. 4).

Comment: The patient presented a progressive paralysis agitans syndrome but with bilateral Babinski's sign following closely on a febrile attack. The lesion was bilateral and of relatively short duration, and all the cardinal signs of brain tumor were absent. The

picture presented differed little from that of progressive Parkinsonian types of encephalitis seen perhaps more frequently at present than during 1921. The involvement of both sides is peculiar and the nonappearance of any of the features of the so-called thalamic syndrome is hard to explain, unless perhaps only a portion of the thalamus was affected.

Case 3 (A361792). G. V., a boy, aged nineteen months, was brought to the Clinic June 16, 1921. The parents complained that the child had become backward and was unable to walk.

The mother had had a normal pregnancy and nothing unusual was noted in the child until four and a half months before, when he had developed a slight stiffness in the left side of his body. He had had a tendency not to use his left arm and leg and a few weeks later he had begun to hold his head as if it were pulled over to the right side. At that time the right side of his face had become paralyzed and his right eyeball did not move as freely as the left. Three months before, the child's right arm had become limp and useless and his left eye had turned inward. This internal strabismus lasted about three weeks and disappeared; the right arm, after being completely paralyzed for two weeks, had been slowly regaining function. About two months before, the child had had whooping cough, and was ill for two weeks; since then he had become less active, and his left eyelid had drooped until finally it remained completely closed. He became dirty in his habits and had attacks of shaking all through his body with cyanosis and unconsciousness followed by drowsiness and sleep. His drowsiness increased, and he was very irritable while awake. He had ceased to walk and was unsteady and ataxic when crawling. General physical examination with urinalysis and blood count showed nothing abnormal. The Wassermann reaction on the blood and cerebrospinal fluid was negative and there was no lymphocytosis of the cerebrospinal fluid.

Examination of the eyes showed evidence of previous choked discs, but they were not swollen although the margins were blurred and there was some pallor. There was ptosis of the left upper lid and all extra-ocular movements were poorly performed without actual strabismus. Roentgen-ray examination of the head and von Pirquet's test were negative.

The neurologic examination, very difficult to make, disclosed bilateral facial palsy with complete ptosis of the left eyelid. The child's right arm was weak and toneless and he showed bilateral Babinski's signs. All tendon reflexes were increased more on the left side. He was very ataxic and unable to walk and had marked incoördination of his hands. His skull, on being tapped, had a "crack pot" percussion note, his head measured 52 cm. in its greatest circumference, and the chest 50 cm.

A final diagnosis of tumor of the brain of uncertain locality was made. Two days later the child suddenly died of respiratory failure.

Necropsy revealed a large diffuse, soft, pale tumor plainly visible

on the under surface of the brain (Fig. 5). Sections of the hardened brain showed a much wider involvement than at first sight. It had apparently arisen in the floor of the fourth ventricle and pushed the ependyma upward, distending the ventricle greatly with the two ependymal surfaces in apposition like the layers of the pleura. This seemed the oldest, largest, and most degenerated portion of the tumor (Fig. 6). It had then burst through the left side of the pons, destroying the three cerebellar peduncles and had passed forward along the base of the brain, filling the interpeduncular fossa. It

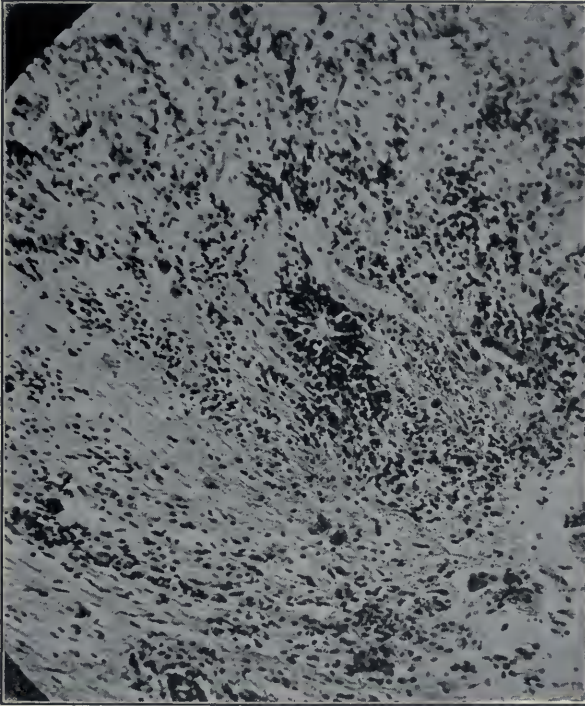


FIG. 8 (Case A361792). Glioma showing rosette shaped arrangement around a blood vessel (x 100).

finally insinuated itself up through the lateral fissure into the inferior horn of the left lateral ventricle, filling it, and bearing the same relation to the ependyma as it did in the fourth ventricle, that is, pushing it before itself. The inferior horn was greatly distended and by compression the tumor had flattened the left optic thalamus (Fig. 7). The bulk of the cerebellum was free and the midbrain was merely covered by the tumor, except just where it joined the pons where it suffered the same destruction on the left that the pons had.

Microscopically the tumor was a very cellular glioma composed of small, round, or oval cells with large, deeply staining nuclei, and

only slight intracellular fibrillæ. These cells tended to be arranged in clusters around the blood vessels. The greatest degree of degeneration was found in sections taken from the large mass in the fourth ventricle. Sections through the ependyma where it was in juxtaposition to the tumor showed no invasion (Fig. 8).

Comment: The short history, the fluctuating course, and the diffuse bilateral signs did not at first suggest a tumor. Tuberculous meningitis or encephalitis seemed more likely. The degree of choking in the fundus of the eye was extremely slight, not in proportion to the severity of symptoms. The pallor might indicate a relatively old process, but the enlarged head and "crack pot" percussion note, absence of tuberculosis in other organs, and normal cerebrospinal fluid make the diagnosis of brain tumor more reasonable. This huge tumor that had involved nearly the whole base of the brain was an unexpected finding, but well explained the bilateral diffuse character of the symptoms.

DISCUSSION

These three cases illustrate the difficulties in diagnosis of a tumor at the base of the brain and especially one in intricate relationship with the third and fourth ventricles. Perhaps the first two cases simulated encephalitis so closely because the two regions involved were those most commonly attacked by epidemic encephalitis. The lethargic type of this disease is said to be associated with multiple foci of inflammation around the aqueduct of Sylvius, the floor of the third ventricle, and the Parkinsonian type with severe lesions in the basal ganglia and sides of the third ventricle. The third case showed a lesion sufficiently wide spread and diffuse to simulate an inflammatory process, but it chiefly involved the fourth ventricle and interpeduncular fossa. General signs of tumor of the brain were not marked in any one of the three and the neurologic signs present were bilateral, which is characteristic of tumors near the middle line of the brain, either in the stem, third and fourth ventricles, or corpus callosum. Change in the cerebrospinal fluid, elevation of temperature, and leukocytosis were conspicuously absent, a condition more particularly suggestive of tumor although all three changes were present in Bassoe's case.

All three tumors were of a rapidly growing, soft, diffusely infiltrating type, tending to produce symptoms by invasion of brain tissues like a spreading inflammation, rather than by the focal pressure effect of harder and more slowly growing tumors. These tumors, during the invasion of the tissues, may spare some structures and

destroy others indiscriminately, without any regard to anatomic relationship. This type of tumor is the hardest to distinguish from an inflammatory process like epidemic encephalitis by the signs and symptoms it produces.

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SEROLOGY IN BRAIN TUMORS *

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The differential diagnosis of brain tumor in the more perplexing cases is often hindered by the misinterpretation of spinal fluid findings which are variable and difficult to correlate with the clinical picture. In a review of the textbooks on neurology and serology very little is found concerning the serology of brain tumors, the most common statement being that examinations of the spinal fluid are negative, or that a slight trace of globulin is present. Lange, in a recent article, asserted that the diagnosis of brain tumor might be made from the serologic findings alone; this, however, seems doubtful.

It is my purpose here to call attention to some of the unusual serologic findings in brain tumor, to point out the difficulty to be encountered if this laboratory adjunct is neglected, to emphasize the need of considering the spinal fluid findings with the clinical picture, and not solely to depend on the laboratory for diagnosis.

Eight hundred fifty-one brain tumors, so diagnosed clinically, were examined. In every case a Wassermann blood test was performed. As noted in Table 1, in eight patients positive Wassermann reactions on the blood were obtained, and in one a positive reaction was obtained on the cerebral fluid at operation. In three of the patients the second Wassermann test on the blood was negative, in two it was positive. In none of the patients was other evidence of syphilis found. At necropsy tuberculomas were found in two cases and gliomas in two; in the remaining cases necropsy was not performed.

A positive blood Wassermann reaction in cases of brain tumor is not an unknown finding. Cases have been reported by Nonne, Stern, and others. The exact cause for this would require a discussion of the Wassermann reaction and its nonspecificity. Suffice it to say that in the present series of cases, so far as could be determined, there was no evidence of syphilis. It is well to warn against the possible error of regarding as syphilis, a case in which a diagnosis of tumor has

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been made and a positive Wassermann obtained. It is probable that the serology of the blood rarely causes confusion in a case of brain tumor; however, it is important that in every suspected case of tumor a Wassermann test be made, as tumors may occur in patients with syphilis.

TABLE 1
Positive Wassermann Reactions in Brain Tumor

CASE	SEX, AGE, YEARS	LOCATION	BLOOD WASSERMANN	CEREBRO- SPINAL FLUID			REMARKS
				Wasser- mann	Nonne	Cells	
A251073	M 1.9	Optic thalamus and third ventricle	4+ —	—	—	4	Necropsy: tuberculoma
A247912	M 22	Right frontomotor area	—	—	+	19	Cerebral fluid at operation positive
A225031	F 7	Cerebellum	4+ —	—	—	2	Necropsy: glioma of cerebellum
A157390	F 15	Cerebellum	4+ 4+	—			Necropsy: tuberculoma
A142854	F 22	Cerebellum	4+ —				Died at home. Reported as abscess
A90966	M 17	Pituitary	1+				Home; no further data
A86936	M 15		2+				Home; no further data
A84604	M 16	Cerebellum	2+				Necropsy: gliosarcoma of fourth ventricle
A64535	F 35		4+ 2+	—	+	5	Home; no further data

In the series of 851 cases of brain tumors, 252 spinal fluids were examined; several patients had as many as four spinal punctures, bringing the total number of such examinations to 279. Of the group of 252, a positive diagnosis of tumor was made in 127, either at operation, postmortem, or both. The location and type of tumor is shown in Table 2. Practically all portions of the brain are here included, and essentially every type of tumor noted.

One death occurred as the result of spinal puncture (Case A331876). A girl, aged thirteen years, had had headaches, dizziness and vomiting for six weeks. The leukocyte count was 19,000; there

TABLE 2
Location and Nature of the Tumor in the 127 Cases

LOCATION	NUMBER	GLIOMA	ENDOTHELIOMA	SARCOGLIOMA	PSAMMOMA	NEUROFIBROMA	PITUITARY	CARCINOMA	TUBERCULOMA	GUMMA	NATURE NOT DETERMINED
Frontal	26	12	8		2						4
Orbital	1	1									
Parietal	27	14	4	2	1					1	5
Temporoparietal	12	7	2								3
Pituitary	9	2					6	1			
Occipital	5	4			1						
Corpus callosum	3	2	1								
Ventricular	2	2									
Throughout brain (metastasis)	4							4			
Basal ganglion	2	2									
Choroid plexus	1							1			
Third ventricle	1								1		
Basal	2	1		1							
Cerebellar	10	5		2							3
Pontile, medullary	13	9	2	1					1		
Acoustic	7					7					
Fourth ventricle	2			2							

was slight blurring of the discs; roentgenograms of the head, the blood Wassermann and the spinal fluid Wassermann and the Lange tests were negative. The spinal fluid cell count was: lymphocytes 71, and polymorphonuclear leukocytes 59. The child died five hours

after the puncture, due to respiratory failure. At necropsy medullary herniation due to a glioma of the choroid plexus was found. With this exception no unusual effects of puncture were encountered.

This unfortunate death emphasizes the need of care in selecting cases for spinal puncture, and the advisability of warning relatives of the possible consequences. It has been our practice to avoid punctures in patients with tumors of the posterior fossa, especially if there is a marked degree of swelling of the nerve heads. At times the differential diagnosis is of sufficient importance to warrant a risk, but due warning should be given the patient and the family. In 32 of our verified cases of tumor of the posterior fossa, spinal punctures were made without serious after-effects. This does not indicate that less care should be employed, but tends to show that if the proper cases and the proper technic are selected, considerable information may be obtained.

In 41 of the group of 127 cases the serologic findings of the spinal fluid were negative. A positive Nonne was the most common finding, occurring in 67 cases. In 19 cases the findings were very unusual; these cases form the basis of this paper (Table 3).

So far as could be determined the type of tumor does not play a definite part in the serologic characteristics. As might be anticipated, the invading types of neoplasm, such as glioma, give the more unusual findings, not so much because of the nature of the growth as because of the extension and invasion of the membranes and parenchyma. The location of the tumor at first glance does not seem related to the serology. Practically all portions of the brain are involved. Several of the growths invaded the ventricles, but this did not occur often enough to warrant deductions. It seems, however, that such invasion of the ventricles or penetration into the membranes may be a factor in the production of a high cell count. The possibility of an obstruction of the cerebral fluid has been considered, but in this group of nineteen cases, excluding the three cases of pituitary tumor, four showed no change in the fundi, thus making the possibility of pressure rather remote. In three of the cases there were signs of intracranial pressure on roentgen-ray examination. The degree of pressure, as noted in the fundi, does not bear any relation to the location of the neoplasm. The most marked swelling was noted in an endothelioma of the frontal lobe (6 to 7 diopters), while a glioma of the cerebellum produced a swelling of 5 diopters. In other instances, a tumor of the frontal lobe and a cerebellar tumor produced no change in the nerve heads.

TABLE 3

CASE, SEX, AGE	LOCATION	TYPE OF TUMOR	TEMPERATURE	LEUKOCYTES	ALBUMIN IN URINE	ROENTGEN RAY	FUNDI	BLOOD WASSERMANN					CEREBRO- SPINAL FLUID				LANGE	OPERATION	NECROPSY REPORT AND REMARKS
								Wassermann	Albumin	Small Lymphocytes	Polymorphonuclear leukocytes	Wassermann	Albumin	Small Lymphocytes	Polymorphonuclear leukocytes				
A234782 F, 38	Pituitary	Epithel- ioma	99.0		1	Sella large and flat	Negative	—	—	1	1	10				Evacuation of pituitary cyst	Died 4-13-10. Positive blood Wassermann elsewhere		
A254897 M, 38	Pituitary	Squamous- cell epi- thelioma with glial tissue	100.4 99.0	9800	1	Pincal shadow	Negative	—	—	—	—	24				Evacuation of contents of sella	Died two years after opera- tion		
A380367 M, 33	Pituitary	Adenocar- cinoma	98.0	8000		Destruc- tion of sella	Simple optic atrophy	—	+	+	+	33		1223332210		Partial re- moval of tumor	Alive fifteen months after operation		
A369116 M, 45	Orbital and frontal	Endothe- lioma	98.2	7000		Head and chest negative	Choked disc	—	—	—	—	14		0000121100		1. Exploration of orbit 2. Exploration of right frontal lobe	Died five months after operation		

TABLE 3—Continued

CASE, SEX, AGE	LOCATION	TYPE OF TUMOR	TEMPERATURE	LEUKOCYTES	ALBUMIN IN URINE	ROENTGEN RAY	FUNDI	BLOOD WASSERMANN	CEREBRO- SPINAL FLUID				-LANGE	OPERATION	NECROPSY REPORT AND REMARKS
									Wassermann	Albumin	Small Lymphocytes	Polymorphonuclear leukocytes			
A374370 M, 34	Right frontal	Glioma	98.6	8300		Increased pressure in head. Chest negative	Swelling less than 1 diopter	—	—	+	1 36 45	50 20	0001110000	Exploration; tumor not located	Glioma of right frontal lobe extending into lateral ventricle
A298355 M, 54	Frontal, in corpus callosum	Glioma	99.2	7700	1	Head and chest negative	Negative	—	—	+	Many 123 556 76 14		0000012210 0000123333 0000001111		Glioma of cor- pus callosum (anterior por- tion); both frontal lobes involved
A309103 M, 43	Fronto- parietal	Endothe- lioma	98.4	8600		Head negative	Negative	—	—	—	8			Removal of endothe- lioma	Well two years after opera- tion
A64088 M, 44	Right frontal	Endo- thelioma	97.8	10000	1	Head and chest negative	6 to 7 diopters	—	—	+	12		1332221110		Endothelioma

TABLE 3—Continued

CASE, SEX, AGE	LOCATION	TYPE OF TUMOR	TEMPERATURE	LEUKOCYTES	ALBUMIN IN URINE	ROENTGEN RAY	FUNDI	BLOOD WASSERMANN	CEREBRO- SPINAL FLUID				LANGE	OPERATION	NECROPSY REPORT AND REMARKS
									Wassermann	Albumin	Small lymphocytes	Polymorphonuclear leukocytes			
A357092 M, 21	Right frontal	Glioma	99.2	5600	1	Head and chest negative	3 diopters	—	—	+	19		0011222100	Portion of tumor removed	Died at home eight months after opera- tion
A334945 M, 37	Fronto- temporal	Glioma	98.0	12000		Sella size 3	3 diopters	—	—	+	23		0112223200		Glioma in left fronto-tem- poral area
A349047 M, 40	Temporo- parietal	Tubercu- loma (?)				Head and chest negative	2 diopters	—	—	—	10			Removal of tubercu- loma	Died
A255060 M, 50	Left parietal	Glioma	98.6	6800	1	Head negative	Negative	—	—	—	6		0122100000	Exploration negative	Glioma in left motor area
A309419 M, 36	Left temporal	Glioma	101	10000		Head and chest negative	1 diopter	—	—	+	95	96	00001110000	Removal of portion of tumor	Glioma left temporal lobe

TABLE 3—Continued

CASE, SEX, AGE	LOCATION	TYPE OF TUMOR	TEMPERATURE	LEUKOCYTES	ALBUMIN IN URINE	ROENTGEN RAY	FUNDI	CEREBRO- SPINAL FLUID				LANGE	OPERATION	NECROPSY REPORT AND REMARKS
								Wassermann	Albumin	Small lymphocytes	Polymorphonuclear leukocytes			
A283083 M, 37	Right temporal	Glioma	97.4	4400		Head negative	Negative	—	—	16	76		Cerebral fluid removed	Glioma right temporal lobe
A260748 M, 55	Left occi- pito-tem- poral	Glioma	98.6	7800	1	Head negative	Right 3 diopters Left 4 diopters	—	+	72		0000000000		Glioma left temporo-oc- cipital lobe
A264178 M, 53	Right in- ternal calsule. Ventric- ular	Glioma	94.4	8400	1	Head negative	2 diopters	—	+	24		0000000000	Decompres- sion	Glioma in right lateral ven- tricle, pre- sented in posterior horn
A331876 F, 13	Cerebel- lum	Carcinoma with choroid plexus	98.0	19400		Head negative	Slight edema (?)	—	+	21	56	0000000000		Encapsulated tumor in pos- terior fossa

TABLE 3—Continued

CASE, SEX, AGE	LOCATION	TYPE OF TUMOR	TEMPERATURE	LEUKOCYTES	ALBUMIN IN URINE	ROENTGEN RAY	FUNDI	BLOOD WASSERMANN				CEREBRO- SPINAL FLUID	LANGE	OPERATION	NECROPSY REPORT AND REMARKS
								Wassermann	Albumin	Small Lymphocytes	Polymorphonuclear leukocytes				
A161862 M, 21	Cerebel- lum	Sarcoma	98.6	11200		Chest negative	Negative	—	—	—	—	—		Decompres- sion	Died at home. Sarcoma
A378201 M, 48	Cerebello- medul- lary	Endo- thelioma	98.0	6400		Head and chest negative	1 to 2 diopters	—	—	—	—	—	1123221000 4555554320	Exploration: tumor on medulla ex- tending over cord and into vermis	Endothelioma of cerebel- lum and me- dulla

The possibility of an inflammatory condition playing a part in the production of the cell count, as evidenced by the temperature, pulse, leukocyte count, and so forth, did not appear to warrant special attention. In five cases the leukocytes numbered more than 10,000. In one of these cases a temperature of 101.0 was recorded, but there was no evidence of infection. In only one of the five was the leukocyte count more than 12,000. This occurred in the case in which death followed puncture. The possibility of encephalitis was considered in this case and because of the very short history, a puncture was made for differential diagnosis. At necropsy no signs of infection or inflammation could be found.

To attempt an explanation of the cell count in this series of cases would be presumptive. The frequency with which pleocytosis occurs, however, is worthy of note. Of the 127 cases, very positive increase in cells in the spinal fluid was shown in 15 per cent. Unfortunately textbooks do not mention such findings. Kaplan says, "I have never seen a pathologic increase or a hyperlymphocytic count." Nonne has noted an increase in cells in cases of pituitary tumor. Lange, in a recent study of the serology of brain tumors, does not mention pleocytosis. The colloidal gold test seemingly runs a somewhat parallel course, though it is noteworthy that in two cases with a cell count of more than 60 the curve in the gold solution was negative. On the other hand, in one case with a negative cell count, the curve was 4555554320.

The highest cell count occurred in a patient with a tumor of the anterior portion of the corpus callosum. The tumor was a glioma invading both frontal lobes and pressing on the anterior portion of the lateral ventricles. In another patient with a glioma of the frontal lobe which had invaded the lateral ventricle a high cell count was obtained, 36 small lymphocytes, and 50 polymorphonuclears. Such invasion of the ventricles seems to be productive of cell reaction, but it would not suffice as a diagnostic measure.

The nature of the cell count in this series was predominantly lymphocytic; in five cases the polymorphonuclear cells were in excess. In no case did an endothelioma produce preponderance of polymorphonuclear cells, but it must be borne in mind that the endotheliomas were not so extensive as the more rapidly growing gliomas. In no case were tumor cells noted in the spinal fluid, a finding first reported by Dufour, and obviously of extreme diagnostic value.

The time of the spinal puncture in the course of the tumor growth did not seem to have any bearing on the serology so far as could be determined. In several cases the development of the tumor was

positive Wassermann reaction with fluid aspirated from the lateral ventricle. Several cases of gumma of the brain with positive Wassermann reactions of the spinal fluid might be included in this series, but as operation or necropsy was not performed, they were not included.

A positive Wassermann reaction on the spinal fluid in cases of brain tumor is not unknown. However, it should suffice here to call attention to the need of careful investigation in all cases of brain tumor in which positive serologic findings are obtained, as it is not uncommon, because of a misleading serology, to subject a patient to unnecessary treatment for syphilis. Such an experience, while deplorable, has occurred. The contrary holds true, however; simply because a diagnosis of tumor has been made, the possibility of syphilis must not be overlooked. Gumma of the brain, while uncommon, does occur, and treatment, if instituted promptly, may obviate unnecessary surgery.

In a small number of cases the cerebral fluid obtained at operation was yellow, the previous spinal fluid having been clear. In two unverified cases the spinal fluid was found to be yellow. The occurrence of a faintly tinged, yellow fluid in brain tumors has been emphasized by Lange. Although we have not employed his technic, I am inclined to doubt the value of this finding. As a rule, a yellow fluid arouses suspicion of hemorrhage. Serology is apt to lead to confusion as readily as to a correct diagnosis. It is, therefore, important almost from onset without any special change in the serology to indicate the age of the growth. The time of the spinal punctures in the course of the disease in this group of nineteen cases varied from three weeks to three years.

In the entire group of 851 tumors no positive Wassermann reaction on the spinal fluid was obtained. One case (Table 1) gave a hint to be familiar with the various possibilities, especially the more common ones, and to weigh the findings in an open manner.

Brain tumors are to be differentiated from inflammatory condition, especially encephalitis, brain abscess, syphilis, and actinomycosis; vascular diseases, multiple sclerosis, and migraine. The majority of these conditions should cause little confusion, but it is to my chagrin that I have diagnosed an acoustic tumor, migraine, and only recently a young woman presented herself with three decompression scars, still complaining of migraine. Multiple sclerosis rarely causes confusion. However, in the acute types with cranial nerve involvement the symptoms simulate those of brain tumor and

the serology may give further room for doubt. Hence, careful observation must be relied on for accurate diagnosis.

In reviewing thirty-one cases of brain abscess the serology was found to vary so markedly, depending on the stage of the disease, that no typical picture could be determined. As might be anticipated, the findings grouped themselves into two large series: acute abscess with general signs, and serology of a meningitis. Even here, the rule does not hold, since in blood borne abscesses, and occasionally in those following otitis media in which the infection is encapsulated from the start, the serology may remain practically negative. In cases of chronic abscess, the serology may vary from normal fluid to fluid containing numerous polymorphonuclear cells and lymphocytes, depending on the age and location of the abscess. In practically all the cases in which the history extended over several months the serology was found to be negative. It is probably a good diagnostic dogma never to make a diagnosis of abscess, unless the focus of infection can be determined.

In Table 4 several cases are briefly summarized in which the clinical or serologic findings alone might have led to gross error. The importance of weighing carefully all possible evidence, no matter how obtained, is shown. Thus, one patient (Case A359964), while giving a typical history of encephalitis, at necropsy revealed a huge glioma. Another patient (Case A352250), with an original diagnosis of dementia precox, in view of the serology, was considered to have encephalitis, and only a few days before the patient died, exploration was performed as a last resort, and multiple abscesses were found. Comparing this case with Case A299367, serology seems to offer very little aid, as in all probability the latter patient had encephalitis.

Table 4 shows the importance of a study of the spinal fluid whenever feasible, as very often data will be obtained which will throw light on an otherwise obscure diagnosis. It is just as important, however, to balance the serologic findings with the clinical signs, not permitting the presence of unusual spinal fluid phenomena to alter the diagnosis unless the evidence is sufficient.

CONCLUSIONS

1. There is no clear cut, practical, serologic criteria for brain tumor.

2. The presence of a high cell count in the spinal fluid in case of suspected brain tumor, while mediating against it, should by no means rule out such diagnosis.

A206065 F, 49	Tumor of brain	2-18 failing vision. Spring of 1920 frontal and occipital headaches associated with tinnitus and dizziness. Summer of 1921 scotomas, later vomiting and staggering gait. 5-23-22 all symptoms worse, memory poor	Slight horizontal nystagmus. Pupillary reflexes diminished to light. Hearing: left con-tact, deep reflexes active. Romberg present. Gait ataxic	99.0	8900	Nega-tive	Swelling 4 to 5 diop-ters	Posi-tive	Posi-tive	30	55555310	Improvement on specific treatment. Diagnosis: syphilis of central nervous system with gumma
A334945 M, 37	Syphilis of central nervous system	Transient headaches past nine months. Five months ago weakness of left leg with sharp lightning-like pains. Two months ago headaches worse, vomiting and temporary blindness in right eye. Progressively weaker	Pupils unequal. Tremor of hands. Left patellar reflexes not obtained. Romberg present. Doubtful tension on right side	98.6	12800	Sella en-larged	Swelling 5 diop-ters	Nega-tive	Nega-tive	23	0112223200	Treated for syphilis. Death. Necropsy showed glioma of left fronto-temporal area. No signs of syphilis. Diagnosis: tumor of brain

TABLE 4—Concluded

CASE, SEX, AGE	CLINICAL DIAG- NOSIS	HISTORY	SIGNS	TEMPERATURE	LEUKOCYTES	ROENTGEN RAY OF HEAD	EXAM- INATION OF FUNDUS	BLOOD WASSER- MANN	SPINAL FLUID				FINAL DIAGNOSIS AND COMMENTS	
A359964 M, 12	En- ceph- alitis	2-21 chill and fever for about one week. Following this mentally slow, but con- tinued in school. March, gait shuffling and left arm weak. Steadily worse. Early 1922 sluggish phys- ically and mentally, speech heavy, swallowing fluids difficult, gaining weight. Death 6-22	Slight ptosis. Ocular movement upward impaired. Masseters weak. Bi- lateral facial weak- ness and stiffness. Swallowing difficult. Dysarthric speech. Choreo- athetoid movements especially left hand, entire left side weak. All deep re- flexes in- creased, es- pecially on left side. Bilateral Babinski	98.6	7000	Nega- tive	Nega- tive	Nega- tive	Nega- tive	Wassermann	Nonne	Small lym- phocytes	LANGE	Necropsy: glioma of corpus striatum protruding into the right later- al ventricle

A352250 M, 45	Demen- tia	Always "queer" "shut-in". In- fluenza two years ago; emo- tional since. Four months ago erysipelas. Temperature 105, delirious. Good recovery but lack of usual ambition, week ago drowsy, gradual cata- tonic state and stupor. Death 3-27-21	Catatonic ap- pearance. No coop- eration; co- ordination impaired. Will not talk or walk. Doubtful Babinski of both sides. General tremor. Moves left arm more than right	97.4 99.0	10200	Nega- tive	Nega- tive	Nega- tive	Posi- tive	*185555554433 155	Exploration, abscess of right frontal lobe. Ne- cropsy: multiple abscess of brain, frontal and temporal lobes of right side
	pre- cox? En- ceph- alitis?								Posi- tive	205555310000	

*Polymorphonuclears.

3. The serology of brain tumor, encephalitis, multiple sclerosis, and so forth, may be essentially identical, and in itself should not constitute a diagnosis.

4. A positive Wassermann reaction in cases of suspected brain tumor, while suggesting the possibility of syphilis, should not be taken as positive proof of such a diagnosis.

5. The simultaneous occurrence of syphilis and brain tumor, while rare, is not unknown, and with a history of brain tumor and serology of syphilis, or other evidence of syphilis, this possibility must not be overlooked.

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VARIATIONS IN THE DIAGNOSIS OF DEMENTIA PRECOX AND MANIC DEPRESSIVE PSYCHOSIS¹

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In the course of an investigation dealing with Danvers State Hospital material, it became necessary to chart out the admission rate for cases in which the diagnosis of dementia precox had been made. The resulting curve is so startling and so difficult to explain (*cf.* Chart 1) that it has seemed desirable to make an independent study of it and of certain factors which seem to be related to the form of the curve.

Dementia precox first appears in the statistical tables of the Danvers reports for 1903. During 18 years, including 1920, there were admitted a total of 11,064 cases. In 22.4 per cent, or 2482 of these cases, a diagnosis of dementia precox is recorded in the statistical tables. In individual years, the rate has varied from 11.6 per cent to 28.3 per cent. The curve of Figure 1 is remarkable for its abrupt variations from year to year, and for its startlingly deep dips. As such an extremely uneven curve was hardly to be expected, it became necessary to ascertain whether there was any other clinical group which might be related to the variations. The obvious group to study was the manic depressive, since the difficulties in the differential diagnosis of dementia precox and manic depressive are proverbial. The total of the diagnoses of manic depressive is 1739, or 15.7 per cent of the total admissions, varying from 10.4 per cent to 25.4 per cent in individual years. Only a glance at the chart is needed to show that there is a reciprocal relationship, not exact, but close, between the relative numbers of dementia precox and manic depressive diagnoses for any given year. This is well brought out if one studies the swings of the curve for the two groups combined, and notes the much smaller variation there found. The total of 4221 cases in both groups amounts to 38.1 per cent of the total admissions, the yearly rate of admission varying from 32.9 per cent to 41.6 per cent. In the following table all these figures are set forth in detail:

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TABLE I
Admissions to Danvers State Hospital During 18 Years

Year	Total Adm.	Dementia No.	Precox %	Manic No.	Depr. %	D. P.+M. D. No.	%
1903.....	428	118	27.5%	49	11.4%	167	38.9%
1904.....	754	200	26.5	96	12.7	296	39.2
1905.....	514	83	16.1	130	25.3	213	41.4
1906.....	520	116	22.3	82	15.8	198	38.1
1907.....	582	122	21.0	81	13.9	203	34.9
1908.....	629	114	18.1	93	14.8	207	32.9
1909.....	658	160	24.3	99	15.0	259	39.3
1910.....	519	147	28.3	69	13.3	216	41.6
1911.....	573	150	26.2	73	12.8	223	39.0
1912.....	505	99	19.6	92	18.2	191	37.8
1913.....	622	72	11.6	136	21.8	208	33.4
1914.....	567	87	15.3	144	25.4	231	39.7
1915.....	607	138	22.7	107	17.6	245	40.3
1916.....	703	183	26.0	109	15.5	292	41.5
1917.....	766	198	25.8	80	10.4	278	36.2
1918.....	734	172	23.4	102	13.9	274	37.3
1919.....	738	156	21.2	103	14.0	259	35.2
1920.....	645	167	26.0	94	14.5	261	40.5
Totals.....	11,064	2,482		1,739		4,221	
Average.....	615	138	22.4%	97	15.7%	234	38.1%

The average number of cases admitted per year is 615. In 1917 there were 766 admissions; in 1904, 754 (this is explained by the influx of cases from the almshouses that year, as the state then assumed care of all insane); the smallest number, 428, occurred in 1903. If now we compute the *average variation from the median number admitted, we find it to be 79.2, or 12.8 per cent of the mean number of admissions (615)*. This average variation in total admissions is an important figure, since it gives us some idea of the variations in the material admitted to Danvers.

The largest number of cases diagnosed dementia precox was admitted in 1904; the next largest number in 1917; the smallest number in 1913. The largest relative group was, however, in 1910 (28.3 per cent); the second largest in 1903 (27.5 per cent); the smallest in 1913 (11.6 per cent). The average number of admissions per year is 138, or 22.4 per cent of the average admissions. *The average variation in the number of cases admitted yearly is 32.4, or 23.4 per cent of the mean figure (138)*.

The largest number of cases diagnosed manic depressive was admitted in 1914; the second largest group in 1913; the smallest group in 1910. The largest relative group was in 1914 (25.4 per cent); the second largest in 1905 (25.3 per cent); and the smallest in 1917 (10.4 per cent). The average number of admissions per year is 97, or 15.7 per cent of the average total admissions. *The*

average variation in the number of cases admitted yearly is 18, or 18.5 per cent of the mean figure (97).

For the combined groups, the largest number of admissions was in 1904; the second largest in 1916, and the smallest number in 1912. The largest relative group was in 1910 (41.6 per cent); the second largest in 1916 (41.5 per cent); the smallest in 1908 (32.9 per cent). The average number of admissions per year is 234, or 38.1 per cent of the total. The average variation in the number of cases admitted yearly is 30.4, or 13 per cent of the mean figure (234). These figures may well be contrasted in table form.

TABLE II
Variations in the Admissions in the Various Groups

	No.	Aver. No.	Aver. var.	Var. in % of aver. No.
Total Adm.....	11064	615	79.2	12.8%
Dem. Pre.....	2482	138	32.4	23.4
Manic Depr.....	1739	97	18.	18.5
D. P. M. D.....	4221	234	30.4	13.0

It is obvious that the *relative variation* in number of total admissions and of the combined group is practically identical. The correlation between these two is .98, but the correlation of the average yearly variation of cases diagnosed manic depressive with the average yearly variation of total admissions is only .81, and for dementia precox it is even less, being .55.

Variations in the number of cases diagnosed precox or manic depressive *might* be due to variations in the types of cases admitted. But where the variations in the individual groups are so discordant with the variation found to obtain when the two groups are combined, such an explanation is evidently untenable. This conclusion is emphasized by the identical rates of variation found for total admissions and for the combined group. Evidently there are other factors at work, such that even in an institution with a continuing policy and an excellent staff, variations occur which are related more to diagnostic standards than to actual variation in cases.¹

¹ There is no change in the conclusion if we study the variations in relative number of admissions (in per cent). Thus the average admission rate for dementia precox is 22.4%. The maximum rate for any year is 28.3%; the minimum is 11.6%; the average variation from the median is 3.7%. This is 16.5% of the mean figure. The average admission rate for manic depressive is 15.7%; the maximum is 25.4%; the minimum 10.4%; the average variation 3% or 19.1% of the mean. The average admission rate for the combined groups is 38.1%; the maximum is 41.6%; the minimum 32.9%; the average variation 2.2%, which is only 5.8% of the median. In other words, there is nearly three-times as much variation in the relative admission rates for the individual groups as there is for the groups when they are combined.

Attention has frequently been called to the variation between hospitals in the matter of diagnostic standards, and particularly in connection with the manic depressive and precox groups. Not infrequently two hospitals in the same state and same year will show an enormous variation in the number of cases in the two groups; sometimes, indeed, the figures will actually be reversed. For example, in the Fifteenth Annual Report of the Massachusetts State Board of Insanity there are the following figures for first admissions (the "allied to" are included with the main groups):

TABLE III
Diagnoses at Various Massachusetts Hospitals in 1913

Hospital	Total first admissions	Dementia Precox		Manic Depr.		D. P.+M. D.	
		No.	%	No.	%	No.	%
1.....	461	160	34.7%	35	7.6%	195	42.3%
2.....	431	130	30.1	21	4.8	151	35.0
3.....	305	70	22.9	37	12.1	107	35.0
4.....	494	51	10.3	91	18.4	142	28.7
5.....	792	147	18.4	95	12.0	242	30.5
Total....	2483	558	22.5%	279	11.2%	837	33.7%

The variations shown here are very striking. On the face of it, it seems impossible that there should be so much variation in the types of cases that one institution receives only 4.8 per cent of manic depressive cases, while another receives 18.4 per cent; or that one institution receives 10.3 per cent of dementia precox, and another 34.7 per cent. The further fact that no such great variation is found in the percentage for the groups combined would lend weight to the belief that some other factor is at work. If we treat these data as we did the Danvers data, the facts are even more emphatic.

TABLE IV
The Variations in Admission Rates for the Five Hospitals

	No.	Average	Average Variation	Var. in % of Ave. No.
Total admissions....	2483	497	118.4	23.8%
Dementia precox.....	558	112	40.8	36.4
Manic depressive.....	279	56	29.8	53.2
D. P. M. D.....	837	167	40.8	24.4

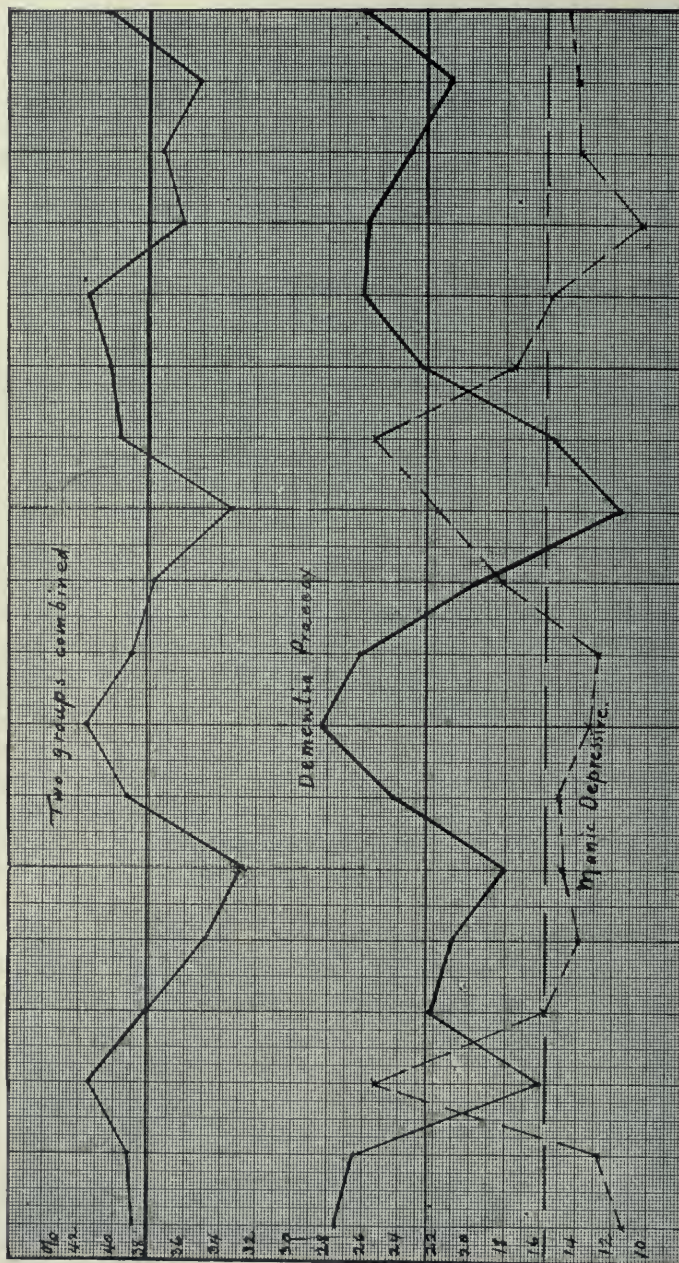
Here we find again that the correlation between the relative average variation in total and in the combined group is very high, viz., .98; while the correlation of the dementia precox group is .65 and of the manic depressive group .45. In other words, the insti-

tutions are in close agreement as to the number of cases belonging in the two groups taken together, but are apparently hopelessly at variance concerning the numbers in the individual groups.

How can such peculiar findings be explained? I am satisfied that the explanation is not to be found in any great variation in the character of cases presented from year to year to the same institution, or in the same year to different institutions. In the face of the facts presented, such a conclusion would be absurd. Can it, then, be due to the fact that the concepts of dementia precox and manic depressive are so vague that it is impossible for several institutions, or for one, or for one individual, to maintain any sort of standards for diagnosis? It is true that we have no exact standard for the diagnosis of either of these conditions, and that often diagnoses are made on an emotional rather than an intellectual level. It is also certain that some at least of the differences between hospitals rests on the differences in their staffs. I am fairly certain that one of the factors in some of the Danvers variations has been the weight of opinion of certain influential members of the staff. Their views on dementia precox or manic depressive have determined the diagnosis in doubtful cases, and have influenced greatly the empathic index of the staff. Differences in viewpoint on these groups are commonly found in men trained in different hospitals, indicating that the hospital viewpoint, dominated by one or two men, is a variable matter.

To show what the situation is when exact objective standards are available, the following analysis of the general paresis group is of interest. From 1912 on the Danvers diagnoses of paresis are based on serological as well as clinical study. During the nine years, 1912-1920, the total admissions were 5887, a yearly average of 654, varying from 505 to 766. The average variation is 72.5, or 11.00 per cent of the mean admissions (maximum variation, 149, or 22.8 per cent of the mean). Paresis was diagnosed in 532 cases, an average of 59 (average admission rate, 9.2 per cent). The average variation in paretic admissions is 4.1, or 7.2 per cent of the mean paretic admission rate (the maximum variation is 8, or 13.6 per cent of the mean). That is, there is less average variation in such a group as paresis than there is in the total admission rate.

It is to be remembered that there is nothing in the figures presented to show what corrections, if any, had to be made in the diagnoses here tabulated. With groups presenting so many diagnostic difficulties, it is evident that often only time and outcome will deter-



Curve of relative yearly admissions in per cent for dementia praecox (middle unbroken line), manic depressive (lower broken line) and the two groups combined (upper unbroken line). The three straight lines across the chart represent the average admissions in per cent for each of these three groups.

mine the correct diagnosis. At present the outcome is the criterion of the correctness of diagnosis in these two groups. Unsatisfactory as this may be, no one has yet found a better test.

The surprising variations found, both in the one hospital over many years and in several hospitals during one year, lead me to believe that for the present statistics respecting these two groups are of little value. To say that 25 per cent of first admissions are cases of dementia precox is to assume an infallibility which does not in fact exist. What happens is that 25 per cent of first admissions *are called* dementia precox; but the term has different meanings for different people, and until some uniformity of standards is obtained, the "diagnosis" is only a term applied within the particular limitations of the diagnostician in the special case or group of cases.

To sum up, it appears, then, that the variation in the number of cases diagnosed manic depressive and dementia precox is excessive as compared with the variation in number in the combined groups, or in the number of cases admitted. This is true for the admissions of eighteen years to one hospital, and during one year for several hospitals. This great variation cannot be explained on a basis of variation in the material admitted. It appears to be directly related to (1) the vagueness of concept and difficulties in differential diagnosis of the two conditions; and (2) the varying standards of diagnosis of the hospital staffs. Statistics based on such diagnoses have a very large margin of error. The solution of the problem of stabilizing the situation is not now obvious: the concepts may need to be changed; perhaps it is a matter of training physicians; perhaps a less routinized and more active medical service may be needed.

CONTRIBUTION TO THE DIAGNOSIS OF EPILEPTIC STATES¹

A NEW STIGMA OF EPILEPSY: RESIDUAL TACHYCARDIA FOLLOWING UPON CESSATION OF OCULAR COMPRESSION IN THE MANOMETRIC INVESTIGATION OF THE OCULOCARDIAC REFLEX.

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INTERN AT THE HOSPITALS

We have made many investigations of the oculocardiac reflex in different affections. Thus we have been led in our service at Bicêtre to a systematic research among children afflicted with epilepsy and among a certain number of adults who have consulted us because of epileptic seizures. Similar investigations were undertaken in 1914 by the authors at Lyons who affirm:²

(1) That in the course of epilepsy the R. O. C. is exaggerated; (2) that the exaggeration is in agreement with the frequency of the crises; (3) that it is influenced by bromid treatment.

MM. Maillard and Codet³ the same year at the Société de Psychiâtrie raised a doubt concerning the greater part of these assertions in agreement in that respect with M. Laignel-Lavastine. We ourselves, having observed 80 cases of genuine epilepsy, have been able to report that their assertions are justified in a number of cases but are not in a larger number of others. In contrast to our predecessors we have worked with the manometric oculo-compressor devised by one of us¹ which permits, so to speak, of measuring out the compression of the eyeballs as to quantity and duration.

¹ Presented at the Académie de Médecine, Paris, June 7, 1921.

² Lesieur, Vernet and Petzetakis: Réflexe oculo-cardiaque. Son exagération dans l'épilepsie. Ses variations sous l'influence d'actions médicamenteuses et toxiques. Bulletin Soc. Méd. Hôpitaux, Paris, March 6, 1914, p. 440; Considérations sur les modifications des réflexes produites par la compression oculaire chez certains épileptiques. Bulletin Soc. Méd. Hôpitaux, Paris, March 20, 1914, p. 510.

³ Maillard and Codet: Société de Psychiatrie, June 18, 1914. L'Encéphale 1914, No. 7, p. 92.

¹J. Roubinovitch: L'oculo-compressenr manométrique. Bulletin de l'Académie Sciences, May, 1916; Bulletin Société de Biologie, April, 1920.

We took the radial pulse 30 seconds after the compression which we wished to obtain and 30 seconds after the decompression, thus always placing ourselves in the same condition for observation. We registered a certain number of tracings with the aid of the sphygmograph of Jacquet.

According to our opinion the question of the R. O. C. in epilepsy divides itself into two large chapters. The first, the less interesting one for us, is the reflex properly speaking, that is to say the bradycardia which follows the compression of the ocular globes with a pressure of 15 cm. of mercury. Here we have obtained variable figures:

Bradycardia strong (more than 25 pulsations), 25 in 80, or 31.2 per cent.

Bradycardia moderate (between 10 and 20 pulsations), 23 in 80, or 28.7 per cent.

Bradycardia feeble (between 1 and 10 pulsations), 22 in 80, or 27.5 per cent.

Absence of reflex or inverted reflex, 10 in 80, or 12.5 per cent.

But there is a second way of viewing the matter and we wish to fix our attention upon an outstanding fact in this connection. In the healthy or nonepileptic individual the pulse returns to normal after the ocular compression has ceased. We have established in contrast to this in the case of the true epileptic in 50 cases out of 80, *i.e.*, in the proportion of 62.5 per cent, the phenomenon to which we give the name *residual tachycardia*. This, in view of its great frequency, has for us almost the value of a stigma.

When the oculo-compressor has been brought back to 0 the hand perceives at the radial artery and the Jacquet registers a temporary acceleration of the pulse lasting from one to two minutes. The pulse when all the ocular compression has ceased increases by 5, 10, 15 pulsations in comparison with the number noted at the beginning of the investigation. We have observed also the persistence of the bradycardia in a half score of patients. The pulse returns to normal only some minutes after the cessation of the ocular compression. It seems to us of service here to recall the frequency of certain classic stigmata of epilepsy for comparison with that of the residual tachycardia.

Cranio-facial asymmetry encountered by Garel 55 times in 100 epileptics.

Strabismus in 25 per cent of Féré's cases.¹

¹ Ch. Féré: Les épilepsies et les épileptiques. Paris, F. Aloin.

Recent or very old and deformed cicatrices are found as diagnostic aids in only 40 per cent of the cases.

And even in regard to the frequency of the biting of the tongue there are many exceptions.

The predominating phenomenon of the residual tachycardia, therefore, according to our opinion, affords great interest from two points of view.

First as a new element of differential diagnosis of the epileptic states as distinguished from the pithiatic syndromes. For the epileptic manifests this residual tachycardia after ocular compression, the pithiatic during the application of the oculo-compressor or immediately after, thus establishing a typical crisis which fixes the diagnosis. Besides the curve of his pulse is normal. We have observed, however, that very frequently the epileptic crises manifest themselves in the half day which follows the taking of the oculocardiac reflex. The residual tachycardia is noted also among those patients who reveal not the clear, decisive, established crises of true epilepsy but merely the equivalents such as ophthalmic migraine, vertigo, and also in cases of Bravais-Jacksonian epilepsy.

Then as a means of therapeutic control also it can furnish valuable indications. We will merely outline this question to-day, giving ourselves for the time being to certain investigations in this direction. We may say in the meantime that in certain of our epileptics we have seen the curve of the reflex change under certain therapeutic influences, the residual tachycardia tending to lessen and the reflex itself tending to return to normal.

The explanation of this phenomenon of the residual tachycardia seems to us difficult to supply in the present state of our knowledge of epilepsy on the one hand and of the oculocardiac reflex on the other. Do epileptics belong to the sympathicotonics or on the contrary to the vagotonics? In compressing the eyeballs does one press more or less upon the pneumogastric trunk or on the contrary upon that of the great sympathetic? The investigation which we are directing toward this pathogenic idea we hope some day will be crowned with success.

SOCIETY PROCEEDINGS

NEW YORK NEUROLOGICAL SOCIETY

THE FOUR HUNDREDTH AND THIRD REGULAR MEETING, MARCH 6,
1923. DR. EDWIN G. ZABRISKIE, PRESIDING

The following Program was carried out :

I. THE PRACTICAL BEARING ON DIAGNOSIS OF THE PHYLOGENY AND CLASSIFICATION OF SPINAL MOTOR INTEGRATIONS

Dr. Walter M. Kraus: The factors necessary to produce postures of the trunk and extremities in normal man are at least three: (1) Determination of the positions of the various parts of the trunk and extremities by means of reciprocally controlled antagonistic muscles. The endogenous spinal fibers linking peripheral motor neurones, play the major part in this determination of postures. Examples of postures thus determined are the position in opisthotonos and of the leg in paraplegia in flexion.

(2) Activation of the neuroses which determine posture. This activation is brought about by afferent impulses entering the spinal cord via the posterior roots and by impulses of supraspinal origin, probably arising in large part in the motor basal ganglia but also in masses of gray matter more caudally situated. When these impulses are permitted to be continuous and increased beyond normal, due to loss of control by superior controlling systems, spastic or hypertonic states result. When these impulses are discontinuous, rhythmic or arrhythmic movements result.

(3) Maintenance of posture by the synergic control of the cerebellar labyrinthine mechanism.

Determination, activation and maintenance are separate physiological activities and originate in separate anatomical mechanisms of the nervous system. A description of the part which the endogenous fibers of the motor portion of the spinal cord play in determining postures was then discussed.

These fibers determine all of the postures of the trunk and extremities except that of erect posture and that which occurs in the arm in cerebral hemiplegia. These two latter postures are most probably of supraspinal origin. When muscles are activated by means of the action of the corticospinal tract (upper motor neurones of the pyramidal tract) upon anterior horn cells, the postures determined at physiologically lower levels are destroyed.

In order to determine the endogenous spinal connections which

correlate the various segments of the anterior horn cells of the spinal cord, it becomes necessary first to consider the anatomical arrangement of these cells in man as well as in lower animals. It has long been recognized that they are divisible into two large groups—one mesial and having to do with the axis, the other lateral and having to do with the extremities. The mesial group, furthermore, is divided into two subgroups, one dorsal, the other ventral, which supply the corresponding dorsal and ventral axial muscles (Tilney and Riley). The lateral parts of the anterior horn cell columns are present in the cervical and lumbosacral enlargements and have to do with the extremities. According to the best authorities, the localization of these cells is such that the most distal (this is, the ventral) muscles are controlled by the most dorsally placed cells.

The movements of the trunk are brought about by synergic contraction of the dorsal and ventral muscle masses on the two sides in various combinations. However, first the anterior horn cells controlling either ventral or dorsal muscles on one side are linked by inter and intra segmental fibers. Further linking of these groups, one to another, dorsal with dorsal, ventral with ventral, or dorsal with ventral on either right or left sides, is also present. When the dorsal and ventral group on one side are made to contract in unison and in excess of the corresponding group on the other side, lateral movements are produced. On the other hand, when the right and left dorsal muscles are made to contract in unison in excess of the right and left ventral muscles opisthotonic reactions result, while, per contra, when the right and left ventral masses are made to contract in unison in excess of the right and left dorsal masses, emprosthotonic reactions result. This leads to the possibility of classifying some of the integrating functions of the endogenous fibers of the spinal cord as follows:

Unilateral axial

- a. Dorsal (R & L)
- b. Ventral (R & L)
- c. Dorsoventral (R & L)
- d.

Bilateral axial

- a. Dorsal
- b. Ventral
- c. Dorsoventral (opisthotonos,
emprosthotonos)
- d. Dextrosinistral

An analysis of the integrative control of the extremities can best be made on the basis of the various phases of normal reflex stepping. The speaker than reviewed his recently published grouping of the phases of reflex stepping. (Archives of Neurology and Psychiatry, Vol. 9, p. 184.) There are two pairs of corresponding opposite sets of activities, the simpler pair representing movements of animals with singly-hinged appendages (fish) and represented in man by pendulum-like movements at the shoulder and hip, the second pair representing the phases appearing in terrestrial animals. These two latter phases have already been described by Sherrington and others as the flexor and extensor phases of reflex stepping. They are superimposed upon the first pair and conceal it except at two stages. The muscles of the extremities, as the speaker has also pointed out,

are familiarly known to be divided into dorsal and ventral groups. In the first two phases of reflex stepping showing movements at the shoulders and hips, both the ventral and dorsal masses acting at these joints are each separately integrated by the endogenous fibers of the spinal cord. The anterior horn cells of the ventral group are made to act together and so also are those of the dorsal group. Further integrative activity combines the dorsal and ventral antagonistic muscles by reciprocal innervation so as to make coördinated movements possible. Furthermore, the limbs on the same side of the body, as well as the pairs of fore and hind limbs, are similarly linked. This makes the following classification of integrating functions possible:

Primary

Unilateral Appendicular

- a. Dorsal (R & L, 1 limb)
- b. Ventral (R & L, 1 limb)
- c. Dorsoventral (1 limb)
- d. Dorsoventral (fore & hind limb, R or L)

Bilateral Appendicular

- a. Dextrosinistral (fore limbs)
- b. Dextrosinistral (hind limbs)
- c. Dextrosinistral (all limbs)
- d. Dorsoventral (all limbs)

The third and fourth phases of reflex stepping represent an alternation at the three great joints of activity of dorsal and ventral muscles. During walking the act of carrying the leg from the backward to the forward position by means of flexion, represents the third phase, while the act of support represents the fourth phase. The positions of paraplegia in flexion and paraplegia in extension also illustrate these two phases. The integrating activities of the spinal cord determining these positions may be designated as follows:

Secondary

Unilateral Appendicular

- a. V D V (R & L, 1 limb)
- b. D V D (R & L, 1 limb)
- c. V D V—D V D (R & L, 1 limb)
- d. V D V—D V D (fore & hind limb, R or L)

Bilateral Appendicular

- a. Dextrosinistral (fore limbs)
- b. Dextrosinistral (hind limbs)
- c. Dextrosinistral (all limbs)
(normal reflex stepping)
- d. V D V—D V D (all limbs)
(decerebrate & decapitate postures)

When all four extremities are set into posture by the ventral muscles acting at the hip and shoulder, by the dorsal muscles acting at the elbow and knee, and by the ventral muscles acting at the wrist and ankle and below, the animal is in the extension position of decerebrate posture, while when the antagonistic muscles are active it is in the flexion position of decerebrate posture. That both of these corresponding and antagonistic positions are characteristic of decerebration has been recently pointed out by Bazzett and Penfield. The evidence that these postures are spinal in origin and dependent upon the activity of the endogenous fibers of the spinal cord is easily found by examination of the work of Sherrington, Von Monakow, Riddoch

and Lhermitte, in cases of complete division of the spinal cord in animals and man. Further proofs have already been given elsewhere by the speaker.

A lantern slide demonstration of the positions of the trunk and extremities in various nervous diseases illustrated the above described integrating activity of the endogenous fibres of the spinal cord in a number of different diseases of the nervous system.

Discussion: Dr. Smith Ely Jelliffe said: I unfortunately missed the first part of Dr. Kraus' interesting presentation, but it would be remiss on my part not to say some word of commendation for what he has done for us this evening. Rarely have I heard in this Society so sincere, detailed and careful an analysis of very important physiological activities. Dr. Kraus has set before us a scheme of the analysis of voluntary motor function which is becoming more and more insisted upon. Considerations concerning walking and postures have been discussed largely as matters of general description and such discussions have lacked precise, dynamic concepts. Dr. Kraus' presentation is highly desirable in that he has shown that these are not haphazard things and that we must be more specific in describing them and state where the impulse arises and where it goes. We must make a more accurate grouping of the process, and that is precisely what Dr. Kraus has done for us.

There are one or two points to which I would like to call attention, and which have some connection with the work of Tilney and Riley as set forth in their book, and which Dr. Kraus has quoted. They speak of an impulse arising within a motor cell and going to another cell. No impulse arises in a motor cell. Every anterior horn cell is only a part of a reflex arc. The impulse comes from the outside and the idea of its autonomous origin in the cell is a faulty concept. The spinal cord never exists by itself and cannot be explained on the basis of its own activities. It must be related to external environmental factors. Environment and individual are one and inseparable.

I do not think that the concept presented by Dr. Kraus, regarding the columns, is correct. We cannot insist too dogmatically on the continuity of columns, which, in reality, are more or less broken or segmental. The cell groups are arranged in columnar form, but one cannot speak of the *function of a column*. The column has no function, although different segments within the column have partial functions in the handling of reflex activities.

Dr. Kraus knows that I have been very much interested in the localization of muscle groups. That interest has extended to attempts at explaining the breakdown in various types of integrations in cases that are not fully understood. It may be remembered that I have expressed views on the connection between vascular integrating factors and muscle group integrating factors in multiple sclerosis of certain types, and have tried to show that unconscious wishes on the part of the individual to bring into effect certain types of activity on the environment (kicking the world in the face, for instance) may give rise to changes in the muscular and vascular

integrative factors, which may determine a breakdown in parts of the machinery, related to those that Dr. Kraus has brought forward.

In connection with the subject of posture may I record an observation: A patient was brought to my office with numerous records setting forth that she was subject to an hysterical limp. I noticed certain affective reactions as the patient walked, and I asked whether an X-ray had been taken and was told that it had not been done. I felt it important to have an X-ray taken and when it was done it showed what appeared to be a myeloma, but this was later reported to be a giant cell sarcoma of a nonmalignant type, at the lower end of the left tibia. I took considerable interest in the genesis of the giant cell sarcoma and asked myself how could this have occurred, as I believe that all problems in medicine have a neurological basis. I first told her husband that the difficulty was a surgical one. He was greatly amused at the situation which had brought him to a specialist in "hysteria" to discuss a sarcoma of the tibia.

In the process of investigation as to her general psychical state it soon became apparent that she constantly held the left leg, night and day in a continuous postural attitude. Study of the unconscious showed that this posture served two purposes: (1) Partially protecting the vagina from attack from the external world, that is unconsciously protecting herself from sexual assault, and also (2) keeping the labiæ together in order to produce masturbatory satisfaction. It would be an interesting point to find out what muscles are involved in such a postural attitude and what relationship these muscles have with the ligaments at the lower end of the tibia concerned in the pull of the chronically used muscles. Further what is the relationship between the chronic stimulus of the ligamentous play on the bony structures which we know are interrelated. Is it possible that a chronic postural attitude can have relation to a chronic interrelated reaction of the ligaments, producing an irritation in the underlying bone, causing a giant cell sarcoma?

Dr. W. M. Kraus (closing), said: It is, of course, true, as Dr. Jelliffe has remarked, that impulses do not arise within motor cells but are dependent upon impulses afferent to the motor cells. What Dr. Jelliffe has said in regard to cell columns is quite in accord with my own feeling. I have not discussed the relation of the extent of these columns to embryological groups of muscles, since that is an extensive subject. The existence of a column of cells depends upon the appearance in the course of evolution of a new group of muscles. The mere fact that several lateral columns of cells have been added to the mesial columns where limb control has become necessary, indicates this. A definite column of cells has only the functions of controlling, subservient to afferent impulses, the particular muscles it serves and in so far may be said to have a definite function.

As to the genesis of a giant cell sarcoma on the basis of postural reflex, that transcends my powers of imagination. But the muscles and ligaments involved in the production of any given posture may be described without difficulty.

II. A FEW REMARKS ON THE HISTOPATHOLOGY OF AMAUROTIC FAMILY IDIOCY, WITH LANTERN SLIDE DEMONSTRATIONS

Dr. Joseph H. Globus: In the course of an anatomical study of the infantile (Tay-Sachs) and juvenile (Vogt, Spielmeyer) forms of amaurotic family idiocy, the following observations were made:

(1) The total or partial cell changes, as described by Shaffer, form the background for all forms of this disease.

(2) These common features as well as the occurrence of transitional forms do not allow of the separation of the disease into anatomical groups, permitting only of a division into clinical forms.

(3) Contrary to the general impression and repeated statements, that the disease process is limited to the gray matter and involves every ganglion cell of the cerebrospinal axis, it can be said that the white matter in many instances is equally involved, and that many cells in the gray matter may escape the disease process.

(4) The frequent involvement of the cerebellum must be looked upon as extension of the same pathologic process, and not as another, added feature to the disease.

(5) Each case, or group of cases, may have its peculiar staining reactions. This staining variation is simply an expression of the chemical character of each case or group of cases.

(6) In the complete absence of inflammatory change, and in the presence of all the earmarks of a degenerative lesion, it may be concluded that the disease is degenerative in character and due to some metabolic disturbance.

Discussion: Dr. I. Strauss said: While there are variations in the disease process, the fundamental changes are present in all cases of this kind. There are changes of a secondary nature which may be varied either in their intensity and their distribution. In the case which I studied, and to which Dr. Globus referred, I observed very little change in the white matter. The spinal cord showed involvement of the anterior horn cells but no change in the fibers of the cord when stained by the Weigert-Poe method. The interest to me in this disease rests in two factors. In the first place this variety of disease (including the forms described by Vogt, Spielmeyer and Sachs) is one of the few diseases of the central nervous system that has a characteristic histological picture which makes the diagnosis of the disease absolutely positive. Another point about the disease is that we are dealing with something that is very fundamental in the organism, namely, with changes in the germ plasm as well as factors introduced of an endogenous character. It has not been discovered what it is that causes such tremendous destruction of the cellular elements. In all the causes one notices that the children are remarkably well developed infants and show no signs of paralysis. Even if they do not die because of the disease, but of intercurrent infection, one finds a very extensive disease process and one wonders how the function of these cells can persist to the high degree in which it does, in spite of the remarkable morphological change and destruction.

It points out one fact, and that is, that when there occurs what appears to be, morphologically, a very marked alteration of the cell, still there is enough function apparently going on in that cell to maintain the processes of life. Therefore, there is something in the functional activity of the cells of the central nervous system of which we know very little at the present time, and they cannot be measured by their morphology. I am connected with another worker in the study of these brains from a chemical standpoint and it may be that in the study of the brains which we are undertaking we shall find definite chemical changes in the constituents of the brain. That, of course, will only be another side light upon the question. I think the actual discovery of the cause of this remarkable disease is something which is going to baffle us for many years, until we know something more regarding the actual nature of the function of the central nervous system cells.

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

MEETING MARCH 15, 1923. F. K. HALLOCK, M.D., PRESIDENT,
IN THE CHAIR

CEREBRAL HEMORRHAGE IN YOUNG ADULTS—TWO CASES

Dr. Benjamin T. Burley gave a description of this syndrome in two young adults.

Case 1, a man of 18, of healthy parentage. He had been well save for an injury with enucleation of a left eye the year previous.

On April 18, 1922, began to notice that he did not feel well as usual at his work in the shop and he soon developed a severe headache. He started home but staggered and fell. His father took him home. His physician twice administered one quarter grain of morphine without much effect upon the headache. Dr. Burley saw him the next morning and he was sent to the hospital. Excessive pain from a headache, particularly of the right side, photophobia and blurred vision were present. The right pupil was somewhat dilated but it reacted promptly. Knee jerks were lively, the left greater than the right. There was tendency to ankle clonus and positive Babinski and Oppenheim reflexes on the left. There was moderate *tâche cérébrale*. There was no anesthesia except a complete asteriognosis of the left hand. Coördinating movements of the left arm and leg were imperfect. There was no nystagmus and no muscular tremor. Temperature was 98.6° F.; pulse, 56; blood pressure, 130/70. The spinal fluid was sanguinolent, under moderate pressure. The blood gave increased albumin and globulin. Wassermann was negative. White count was 8800.

Increased intracranial pressure was shown by the rapid development of choked disc in the right eye and the headache became so unbearable that a right exploratory craniectomy was decided upon. An area 3½ inches in diameter over the parietal and upper temporal

lobe was exposed, showing a nonpulsating brain with somewhat flattened convolutions and resistance in the area of the posterior central gyrus. A blunt trocar inserted in this area gave a dark clot from the depth of $\frac{5}{8}$ of an inch. Ventricular tap also evacuated old blood clots with some hemorrhagic fluid. After a subtemporal decompression with drainage, the skull flap and skin flap were replaced.

Absolute relief of the headache followed the operation, vision returned on the following day so that flowers could be distinguished across the room and the patient made slow but practically uninterrupted recovery. After two or three weeks the asteriognosis and spasticity of the left side practically disappeared. The neuroretinitis of the right eye markedly subsided and the patient returned to his home after one month. He later went back to his work and has remained absolutely clear of all cranial symptoms.

Case 2, a woman of 31 years, unmarried, office clerk with no particularly significant factors in her family history. A year and a half previous she had a uterine fibroid removed followed by slow recovery with asthenia. Although slightly lacking her usual animation in recent months she had no significant symptoms until one week before entering the hospital. One morning as she stooped over to put a cat out of doors she developed a terrific headache over her right eye. This pain lasted from two to three hours and was accompanied by nausea and vomiting. She received "osteopathic" treatment for this condition before entrance to the hospital. Four days after the onset the right eyelid began to droop. Two days later she had another sudden terrific headache lasting about twelve hours. This attack was preceded by a convulsion and vomiting occurred later. She was then removed to the City Hospital on April 20, 1922.

Examination showed a well developed and well nourished young woman. There was paralysis of the third right cranial nerve. There was no other cranial nerve involvement, and no sensory disturbance; there was moderate *tâche cérébrale* but no incoördination and no vasomotor disturbance. The headache was severe over the right eye. Pulse was 50; temperature, 98.1° F.; white blood count, 16,000; blood pressure, 122/84; the fundi at this time were normal. Lumbar puncture showed the presence of some old bloody fluid. Albumin and globulin were three plus. Smear showed no organisms; culture, no growth. Colloidal gold—1111231100. After four days the headache still persisted. Lumbar puncture was again done, showing the presence of blood-stained fluid under moderate pressure. There was some relief from this puncture. Pulse rose from 50 to 60; white count was now 14,200. After being in the hospital one week, optic neuritis began to appear in the right eye and, a little later, in the left.

On April 30, ten days after entrance to the hospital, the patient had another sudden terrific pain over the right eye, with a convulsion lasting 8 minutes. Two hours later lumbar puncture was done by the reader and 25 c.c. of bright, fresh, deeply stained fluid was removed with some relief of her symptoms.

On May 6, 1922, she was seen in consultation by Dr. E. W.

Taylor. On that date she showed definite edema of the discs of both eyes, four diopters in the right and two in the left, with some hemorrhagic areas, more marked on the right. Lumbar puncture was again done, the fluid being at this time less bloodtinged than at the time of her convulsion. The presence of choked discs and failure to relieve the patient led to the decision to do a decompression craniectomy on May 12. An opening two and a half by two inches over the right temporal lobe exposed a brain with a thin layer of blood clot and edema, nonpulsating and with flattened convolutions. Only a decompression operation was attempted. The patient experienced some relief of her headache from the operation but her general condition was not improved. On May 17 she was seized with a series of generalized convulsions and died in one of these.

Autopsy showed a hemorrhage extending from the tip of the right temporal lobe backward and inward, communicating with the lateral ventricle, filling the ventricular system throughout.

The brain was hardened in formalin and sent to Dr. Taylor for further pathological examination.

PATHOLOGICAL EXAMINATION IN CASE 2

Dr. E. W. Taylor: *Macroscopic Appearances*.—Extensive subpial hemorrhage on the mesial and inferior aspects of the right temporal lobe, also in the region of the cisterna magna of the oblongata, especially on the left side, extending over the cerebellum in the median line and also somewhat laterally; no hemorrhage in the interpeduncular space; considerable collection of blood in the cerebello-pontine angle, especially on the left side; the third nerve on the right more or less compressed by hemorrhage. On section of the brain through the anterior portion of the temporal lobes a large hemorrhage about $3\frac{1}{2} \times 2\frac{1}{2}$ cm. in size occupies the tip of the lobe on the right, reaching the surface inferiorly and mesially. This hemorrhage has ruptured into the descending horn of the right lateral ventricle, which is filled with blood. There is at this point much less blood in the left ventricle; sections posteriorly show both lateral ventricles and the third ventricle completely filled with blood; frontal section through the oblongata and cerebellum shows the fourth ventricle to be completely filled also. The course of the hemorrhage was evidently from the original focus in the right temporal lobe through the descending horn of the right lateral ventricle and thence through the other ventricles, appearing finally in the cisterna magna, and thence extending somewhat over the cerebellum and in the cerebello-pontine angles.

Macroscopic examination shows the brain tissue destroyed and invaded by hemorrhage, without evidence of tumor. Sections made through the temporal lobe in the neighborhood of the primary hemorrhage and through the region of the third nerve nucleus do not show characteristic lesions of encephalitis and although this diagnosis cannot therefore be substantiated, it is possible that a more complete examination of other portions of the brain might lead to a different conclusion.

Dr. Burley: These cases are of considerable interest from the

presence of massive cerebral hemorrhage in two young people, both having unbearable headaches and increasing intracranial pressure with rapidly developing choked discs requiring operative interference. Neither case showed a neoplastic origin of the hemorrhage, nor yet any gross signs of an inflammatory cause. I am inclined to the opinion, however, that an encephalitis virus was a prominent factor in the etiology, this deduction being arrived at from my experience with three epidemics of encephalitis following closely upon epidemics of influenza and, further, evidence of hemorrhagic disease of the newborn appearing in the Worcester hospitals coincident with the encephalitis. Further data of a predisposition to hemorrhage following influenza and encephalitis will be awaited with interest.

Discussion: Dr. E. W. Taylor: As Dr. Burley says, he was good enough to ask me to see his second case in consultation. The evidence of tumor seemed to me, and I think also to him, to be slight in consideration of the very rapid onset of the symptoms and the general appearance of the patient, in spite of the fact that she had a rapidly increasing choked disc with ultimate complete paralysis of the third nerve on one side. The possibility of a latent glioma with sudden hemorrhage leading to increased pressure was considered. One of the striking conditions on the clinical side was the blood-stained spinal fluid after most of the punctures, with a tendency to become deeper as the fluid was withdrawn. The massive ventricular hemorrhage must have occurred very shortly before her death, in spite of the fact that the blood in the fluid would seem to point to the fact that the blood had escaped into the spinal cord earlier. The microscopic examination of this area in the temporal lobe showed no tumor. There is a certain amount of reaction around the hemorrhage, which would occur in any case in so extensive a lesion.

The conclusion which Dr. Burley has reached from the clinical observation of the case is that we have to do with an encephalitis and, as he also suggests, hardly of the epidemic form. Certainly on the clinical side it is a very unusual development of encephalitis lethargica. It is possible that when further sections are made, we may find evidence as indicated by Dr. Cobb's preliminary observations, of perivascular infiltration which will bring it into the category of encephalitis. In the literature very small mention is made of hemorrhage as being at all a constant pathological finding in encephalitic lethargica.

Just a word about the first case, which appears to me still more mysterious. I happened to see this man also, when he was on the high road to recovery. Why he recovered it is difficult to see, through a simple decompression operation with the relief of his symptoms of intracranial pressure and without residuals of any sort. The cases taken together form a small group of hemorrhagic disease of unusual rarity, and it seems to me of very great interest.

Dr. Gilbert Horrax: The two cases are certainly of extraordinary interest, as Dr. Taylor has said. I was struck in the report of

the second case with the fact that this woman had a complete ptosis and pupillary changes of the third nerve, and it occurred to me that we might be dealing with an aneurism of the base which had suddenly burst. We have had several cases at the Brigham Hospital with similar neurological signs. However, an examination was made at the base of the brain in this woman and no aneurism demonstrated. In the first case it is a little problematical as to just what the boy had: whether the clots that came through the needle were due to trauma to the cerebral vessels, or from a large clot. The lack of brain pulsation with marked tension at time of operation would indicate the latter. The fact of the blood filling up the ventricular system early doesn't seem to me at all inconsistent. The natural assumption is that such filling up would lead to sudden death, but sometimes it may go on for a long time, through the ventricles and down the cord, before causing death. These cases certainly make a very valuable contribution and are of interest from the point of view of age as well as in other ways.

Dr. Stanley Cobb: The specimens I looked over this morning indicated an encephalitis and not of the lethargic type.

Dr. H. R. Viets: I should like to ask if these cases are not somewhat analogous to the cases of spinal cord hemorrhage coming on acutely which Dr. Burley reported several years ago: acute ascending myelitis?

Dr. B. T. Burley: Replying to the question of Dr. Horrax as to the need of operative interference in Case 1, I would call attention to the presence of rapidly increasing choked disc in the right eye, the left having been previously lost, as sufficient reason for an exploratory craniectomy with subtemporal decompression.

Regarding the question raised by Dr. Taylor as to rapid fatality from ventricular hemorrhage, these cases, particularly Case 2, showed the presence of fresh blood from lumbar puncture consequent to fresh cerebral hemorrhage, giving us evidence that hemorrhage into the ventricular spaces is not always promptly fatal.

Replying to Dr. Viets' question, there is an interesting analogy in the different types of acute ascending myelitis and the different types of encephalitis, particularly those with and without hemorrhage.

AN UNUSUAL TUMOR OF THE THIRD VENTRICLE IN A CASE OF DIABETES INSIPIDUS

Drs. Percival Bailey and B. J. Reifenstein presented the anatomical specimens from a case of diabetes insipidus. The history of the patient was as follows:

G. H. C., a schoolboy of sixteen years, was admitted to the medical service of the Peter Bent Brigham Hospital, November 9, 1921 (Med. No. 17,158) complaining of thirst and frequency of urination. Family and past history were essentially negative. The patient stated that three months previous to entry he had a sudden onset of thirst, and has since drunk about five quarts of water daily, with a corresponding increase in amount of urine passed. He was obliged to get up three times or more each night to urinate. In

addition, he was very constipated and had lost about five pounds in weight.

The boy was poorly nourished, with a diffuse brownish pigmentation all over his body. The tendon reflexes were very active, with a tendency to clonus at each ankle. The Wassermann was positive in the blood. The spinal fluid was normal. Antileptic treatment was instituted and continued vigorously, and the polyuria controlled fairly well by intranasal insufflation of pituitrin.

On July 17, 1922, the patient was again admitted to the medical service (Med. No. 19,050) complaining of persistent frontal headache which had been present for two months. For two weeks previously he had had weakness of the legs, and transitory diplopia. For the last four mornings he had vomited his breakfast. He was at this time drowsy. There was an extensive acneiform rash over the body. The reflexes were very brisk. There was general constriction of the visual fields. He was transferred to the surgical service July 21, 1922 (Surg. No. 17,041). At that time he weighed 87 pounds. His intake was 1900 c.c. and output 1500. Metabolic rate was -38 . Blood Wassermann was still feebly positive. He was very emaciated and drowsy. X-ray showed the sella turcica to be normal. The patient became rapidly more feeble and on July 29 it was noted that the pupils were absolutely fixed to light and accommodation. The left pupil was widely dilated and there was a ptosis of the left eyelid. The left plantar reflex gave a dorsal response. The next day the right pupil was also dilated and there was a slight ptosis of the right eyelid. From that time he became very weak. No further neurological symptoms developed. He weighed on August 19, 72 pounds and his urinary output had fallen to 400 c.c. On August 21 his rectal temperature had fallen to 95° and on August 24 he died, with a terminal hyperthermia.

At autopsy the pineal gland was found to be about twice normal size and in the third ventricle was a very vascular tumor, spherical, about 4 cm. in diameter. The pituitary gland was normal. The other organs of the body, especially the kidneys, were normal.

We wish to call attention to the fact that the case was not operated because the usual symptoms of a suprasellar tumor were absent, as were also the general pressure symptoms. The location of the lesion was certain because of the diabetes insipidus. Clinically, the course of the disease simulated closely a basilarluetie meningitis. The histological structure of the tumor was very unusual and a positive opinion as to its nature and origin would have to await further investigation.

Discussion: Dr. Taylor asked what was considered to be the cause of the cessation of the diabetes insipidus—the spontaneous disappearance of that symptom.

Dr. Bailey: That is a very interesting phenomenon, which I cannot explain. It is frequently seen in these patients before death. It is not likely to be solved until we know much more concerning the essential mechanism of diabetes insipidus.

Dr. Taylor: Is it possible that the growth of the tumor caused the cessation of the diabetes insipidus, since as the tumor increased in size the diabetes diminished? Was it a sufficiently destructive lesion to lead to the cessation of the extreme urinary output?

Dr. Bailey: It is difficult to answer these questions because of the inherent difficulty of determining whether any neurological symptom is due to an irritation or to the removal of an inhibition. In this case the tumor had invaded the base of the brain along the perivascular spaces of Virchow-Robin and had also invaded the meninges around the cerebellum and the pineal gland. It may be that this increasing invasion led to a cessation of the polyuria. I have noticed in the case of dogs which have had a very destructive lesion of the hypothalamus that as long as they are lethargic the polyuria is absent and only appears as they gradually recover from their lethargic condition; if the lesion is less destructive the polyuria appears immediately.

FACTS AND FANCIES OF MENTAL HYGIENE

Dr. George K. Pratt, Medical Director of the Massachusetts Society for Mental Hygiene, read this paper.

Misinformation and confusion as to what the mental hygiene organizations are endeavoring to do sometimes appears in medical groups as well as among the laity. As perhaps the latest of the nation's great public health movements, mental hygiene is just commencing to find its feet. It is neither a complete nor an exact science like bridge building or analytic chemistry. Its principles are not as yet sufficiently developed to permit of predicting accurately the degree and kind of response to stresses, strains, or emotional situations. It is not a kind of sect or fad or a new cult. It does not advocate a new faith or system of treatment similar to osteopathy or "The Electronic Reaction of Abrams." It has no special technique or definite system of therapy and is not held out as a panacea for all the mental ills of the community. Instead, mental hygiene feels that, like psychiatry, it possesses a little knowledge concerning the nature, cause, and more especially, the *prevention* of some, not all, mental disorders. It believes this knowledge, admittedly incomplete, is nevertheless sufficient to warrant its withdrawal from laboratory seclusion and its application to actual community problems.

Mental hygiene, if it ever was, is not now in the closely guarded control of a few persons. To-day mental hygiene embraces not only the science of medicine but its practical application brings it into close touch with almost every phase of human endeavor. Thus it contacts fields of sociology, economics, criminology, and so on. Mental hygiene as a public health movement does not endorse unreservedly, extreme viewpoints on either psychoanalysis or psychology. It finds value in the products of both of these schools of thought, but only as *adjuncts* to a program of treatment, and not the entire program itself. State mental hygiene societies have widely different programs. Some engage in clinical work almost entirely, while others devote their activities to educational work. In Massachusetts, where an elaborate state hospital system of out-patient clinics exists, the Mental Hygiene Society engages exclusively in educational work.

The Massachusetts Society for Mental Hygiene functions on the belief that if early detection of early symptoms of approaching mental disorder is a desideratum for prevention, then there is implied

on the part of the public a knowledge of what these symptoms are. And until some of the fog of stigma, superstition, and ignorance that surrounds the mentally sick is dispelled, little can be hoped for in the way of patronage of out-patient clinics. Methods of education are numerous! In the Massachusetts Society for Mental Hygiene they include a Lecture Bureau Service supplying speakers; frequent public conferences; publication of simply worded literature; issuing of a Monthly Bulletin; insertion of courses in mental health training into the curricula of normal schools, nurses' training schools, schools for social work, and the like. Recently attention has been concentrated on conducting instruction or lecture courses of 6-8 weekly lectures for such specialized groups as school teachers, social workers, and nurses. Much recent attention has also been given to focusing interest on the problems of childhood, as the formative, flexible age when good mental habits may best be instilled and faulty ones corrected.

Discussion: Dr. Bronson Crothers: In writing a paper on mental hygiene I wrote as an admitted amateur and outsider who had made an earnest attempt to understand the campaign. The question that came up for chief discussion was the wisdom of attempting to popularize the Freudian and the more extreme psychological points of view. In particular I regretted the publication of books by lay writers for mothers based on Freudian theories and asked for authority for the statement that 50 per cent of mental disease could be prevented by proper recognition and early treatment of conflicts. That statement, made in the heat of a campaign for recognition and financial support, is less aggressively repeated in literature sent out by the Massachusetts Committee which quotes the Governor's message to the effect that 50 per cent of mental disease is preventable. Except for these criticisms of detail I am, of course, heartily in favor of mental hygiene. The reason for writing at all was to call attention to the movement as a whole and to emphasize my own feeling that mental hygiene is not, as many feel, simply a division of psychiatric work. Obviously complete and whole-hearted support of a program which can be agreed upon is essential. In order to stir up discussion on this subject it seemed worth while to present the reactions of an outsider to the fascinating and important series of articles published by the National Committee.

Dr. E. Stanley Abbot: It seems to me that mental hygiene is merely a part of general hygiene. Just as we try to build up the bodies of children and make them as healthy as we can, so the object of the mental hygiene movement is to understand what is necessary for the best development of the mental activities of the child. The mental hygiene movement is trying to find out what the principles are that lie back of all behavior as guided by our mental activities, and it is for that reason perhaps, because the Freudians have done more to analyze the mental factors of behavior, that we turn rather to the Freudian psychology for help. Certainly academic psychology has done very little to help in this field. Mental hygiene has seen the need of studying these mental factors in behavior, and it so happens that the Freudians have done more than any other group to try to analyze the bases of behavior and of our mental reactions in relation to them. That doesn't mean, however, that mental hygienists

have to swallow Freudian psychology bob, hook, and sinker. I don't think any of the men in the movement really do it. It would be unwise to do it, but they do reach out in that direction to get what help they can because help doesn't seem to be coming from other directions.

Dr. Crothers: The question is whether psychoanalysis can be propagated by elementary discussion among laymen.

Dr. Abbot: I do not think it can. I deprecate very much the going into alleged Freudianism by half-baked laymen, clergymen, psychologists perhaps—various helpers of humanity who have no solid medical or psychological background. I don't feel they belong to the mental hygiene movement. They see an economic opportunity in writing on those subjects. It is said that Freud's Introduction is one of the best sellers, and many who are not qualified write books to take advantage of its vogue.

Dr. Bailey: It is a question of fundamental importance to determine just how much of the theory and practice of medicine it is wise to teach the public. Every physician should give the matter earnest thought, especially at the present moment when a new journal, *Hygeia*, is being launched. The future policy of this magazine as well as of the journal of the Society for Mental Hygiene, will depend largely on the reaction of the medical men to the material published in it. The statement that we could prevent 50 per cent of functional nervous disease in children if we could avoid the mental conflicts which gave rise to them does not shock me. I think the figure is probably too low. I am sure, also, that Janet, who cannot be accused of being a Freudian, would take no offense. The problem of determining the nature of these conflicts and the means of avoiding them is still far from solution, although great progress has been made.

Dr. Pratt: Psychiatrists giving popular mental hygiene talks to lay groups are frequently asked afterwards, "What can you do for a child that does so and so?" It is sometimes difficult and not a little embarrassing to explain that it is impossible to offer blanket suggestions for the correction of specific behavior or conduct disorders in children. Unlike the case of the mother who brings her child to the physician for some well recognized physical defect and for which a treatment program can be outlined that would be equally applicable to a dozen cases presenting the same symptoms, one must first in this work discover the particular etiologic factor that produces the trouble. I mean, for example, that three children, all presenting the general symptoms of "tantrums" and lack of discipline, will almost certainly all have distinctly individual and widely differing reasons therefor. This is why we stress in public lectures that the treatment of mental or nervous conditions is a highly individual process and that each case is a law unto itself.

Another thing that embarrasses the progress of mental hygiene work in the community is the tremendously deep feeling of stigma that attaches to the whole subject of mental disease in the minds of a majority of the public. The dispelling of this stigma and fear is perhaps one of the most difficult immediate things confronting the mental hygiene organization. It prevents the early incipient case from receiving the prompt treatment that might abort permanent

invalidism, and it causes many people to hide their mentally sick as if mental disease were a disgrace. A woman wrote to my office this morning asking for information about the care at home of her mother who is destructive, badly hallucinated, and with a number of uncomfortable delusions. After admitting that the family physician advised institutional care this woman went on to say that, "Of course you understand mother is not crazy, but is only a little nervous and we would not dream of putting her away in an asylum." The alleviation and ultimately the dispelling of some of this fog of fear, superstition, and prejudice is a most important objective in the work of the Massachusetts Society for Mental Hygiene.

It is important to realize that various state mental hygiene societies have widely differing programs. Thus in Connecticut the State Mental Hygiene Society finds its chief activity in the field of clinical work. On the other hand here in Massachusetts where there exists a widespread and splendid system of state hospital and out-patient clinics, the Massachusetts Society for Mental Hygiene has sharply limited its work to the field of education and publicity only. The work of the State Division of Mental Hygiene in establishing and conducting clinics, and the work of the Massachusetts Society for Mental Hygiene in performing important developmental work in a community along the lines of education, dovetail together nicely.

One thing I wish to bring out in conclusion: We have at times been mildly criticized for making the general statement that "Mental disease is preventable; mental ill health is curable." We admit that we have made this statement more or less of a public slogan and we also admit that technically speaking this statement is not 100 per cent accurate. The precise amount of mental disease that can be prevented we do not know. Theoretically we all know that general paresis is preventable through absence of syphilitic infection. I think we are also ready to admit that so far as we know at present dementia precox is not preventable.

We feel, however, that the amount of positive knowledge in this matter, admittedly incomplete, is nevertheless sufficient to warrant making a start towards public education in the maintenance of good mental health. The Mental Hygiene Society has been and continues to be interested in not offering mental hygiene as a panacea for all the nervous and mental ills of the community. We publicly stress the limitations of knowledge on this subject and are extremely anxious to avoid being linked up in the public mind with the "applied" psychologist, the commercial psychoanalyst, the "new thought" exponent, and other tassels on the lunatic fringe.

Perhaps the most valuable single factor contributing to the advance of community mental hygiene has been the establishment of the habit clinics which Dr. Douglas A. Thom first instituted at the Baby Hygiene Station a year ago. Such clinics dealing with pre-school age children who are presenting early symptoms of personality defects or behavior disorders are extremely valuable in the maintenance of good mental health, and, of course, the avoidance of later mental disorder as well.

CURRENT LITERATURE

I. VEGETATIVE OR VISCERAL NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Johnson, S. E., and Mason, M. L. THE FIRST THORACIC WHITE RAMUS COMMUNICANS IN MAN. [J. Comp. Neurol., 1921, XXXIII, 77. Medical Science.]

The textbooks of anatomy are not explicit nor in accord as to the existence of a white ramus communicans in connection with the first thoracic spinal nerve. The authors find that in each of twelve subjects examined, one or more white rami arise from the first thoracic nerve and run as a rule to the stellate ganglion. They contain a relatively high percentage of large medullated fibers. The inferior cervical and the first thoracic sympathetic ganglion are commonly, but not constantly, fused. Rami from the eighth cervical nerve are neither white nor mixed in character, and the condition described above is to be regarded as the rule in man.

v. Pauchet and Laborde. BLOCKING THE SPLANCHNIC NERVES. [Médecine, October 1921, III, No. 1.]

The harmlessness and long duration of the anesthesia induced by this procedure is here discussed. Seven cm. from the median line, below the right twelfth rib, at an angle of 45 degrees to the median plane of the body is the place and course of the 12 cm. needle. It is pushed in until it hits the vertebra; then the tip is drawn back into the subcutaneous tissue and is then pushed in again at a slightly different angle until it reaches and just grazes the vertebra. Then it is pushed 1 cm. farther, the needle entering the loose paravertebral cellular tissue. The sensation from this is felt in the hand, gently pushing the needle. On the left side, the needle is introduced 3.5 cm. from the median line to avoid the kidney and aorta. The anesthetic recommended is 25 or 30 c.c. of a 1 per cent solution of procain.

Carlson and Luckhardt. VISCERAL SENSORY NERVOUS SYSTEM. [Am. Journ. of Phys., November 1, 1920, LIV, No. 1.]

Carlson and Luckhardt have studied the reflexes from the visceral afferent system involving the respiratory mechanism, the skeletal musculature, the gastrointestinal tract, the heart and blood vessels, the urinary bladder and purpose going through the reflex arc activities of the vegetative nervous system.

Hansen, A. FATAL BEE STING ON LEG. [Ugeskrift for Laeger, September 22, 1921, LXXXIII, No. 38.]

The pharmacodynamic action of the poison from *Apis* has been neglected by the reigning medical schools. This is a clinical report of the symptoms arising in a woman who had been stung two or three times before and had presented a reaction of increasing severity (anaphylactic). The sting on the left leg was followed in twenty minutes by respiratory paralysis. After revival from this, with artificial respiration and massage of the heart, profound coma followed and the woman died after four days with no inflammatory reaction syndrome.

Schenk. THE BLOOD PICTURE AND VEGETATIVE NERVOUS SYSTEM. [Deuts. med. Woch., October 21, 1920, XLVI, No. 43. J. A. M. A.]

On the basis of a series of personally conducted investigations, Schenk states that in individuals with disturbance of the vegetative nervous system and predominance of the autonomic system we often find a high lymphocyte count and often a slight eosinophilia, whereas no characteristic blood picture is associated with hypertonia of the sympathetic system. Increase of tonus in the autonomic system by subcutaneous pilocarpin injections often produces a slight transient lymphocytosis, but without any accompanying increase of eosinophils. However, the experimental augmentation of tonus in the sympathetic system by injections of epinephrin produces marked changes in the composition of the blood in man. During the course of the first half hour following the injection, the absolute number of white corpuscles in the peripheral circulation increases in consequence of the marked increase of lymphocytes to more than twice the number, dropping then to normal during the next few hours, while the relative and absolute number of neutrophil polymorphonuclears increases and the lymphocytes disappear. The eosinophil cells show no considerable changes in the count over and above the physiologic fluctuation. The hypoeosinophilia and aneosinophilia noted in animals by some writers is always conspicuously absent in man. Neither pilocarpin nor epinephrin, nor the increased formation of hormones which these drugs produce through the mediation of the vegetative nervous system, has an unequivocal effect on the number of the eosinophil cells in the peripheral circulation.

Plaut, F. SINKING VELOCITY OF BLOOD CORPUSCLES. [Münch. med. Woch., March 5, 1920.]

This interesting new type of phenomenon is described by Plaut and results obtained in a number of different conditions reported upon. Thus in 220 cases of nervous and mental disease, including 45 dementia precox, 48 general paresis, 34 psychopathic or hysterias and 24 melancholias, the relative rate of sedimentation was carefully measured. In males the majority of cases of paralysis, syphilis and arteriosclerosis, on the one hand, differ from the majority of cases of melancholia,

dementia precox, epilepsy and psychopathies as regards the shorter period in which sedimentation of erythrocytes in citrated blood plasma takes place. In paresis only one-sixth of the time required in dementia precox is required. Corpuscle agglutination is probably a factor in the acceleration of the sedimentation. The differences in degree appear distinctly only under the influence of the citration and the concentration of the sodium chlorid solution. Acceleration of sedimentation is considered a pathologic sign, the definite significance of which has not as yet been determined. In women sedimentation is more rapid than in men. In women a characteristic acceleration in paresis is seen as compared with other diseases, but the rate is not stable and is subject to physiologic influences.

Durand. AUTOHEMOTHERAPY OF MIGRAINE. [Bull. Soc. de Thér., January 12, 1921.]

This clinical report of a migraine arising late in a woman at the age of fifty. The migraine attacks were accompanied by urticaria. The attacks became worse in the course of six months, until she had only a few days' relief at a time. Durand had recourse to autohemotherapy, which he had found successful in several cases of urticaria. A subcutaneous injection of 10 c.cm. of the patient's blood was made during an attack, and four days later the dose was repeated at the onset of an attack, with the result that for the first time for three months the patient was a fortnight without another attack. The next attack was mild, and the following milder still. During the following months only abortive attacks occurred, and were easily cured by subcutaneous injections of 2 c.cm. of the patient's blood.

Heitz, Jean. CONTRIBUTIONS TO THE STUDY OF THE ORIGIN OF THE VASOMOTOR NERVES OF THE UPPER EXTREMITY. [Archives des Maladies du Coeur, des Vaisseaux et du Sang, June 1922.]

A soldier was wounded in 1915 in the left side of the thorax by a ball which I extracted from the lung some days later. He continued to have such intense pain that in September 1916 the 3rd, 4th and 5th left intercostal nerves were resected at the extremities of the spinal apophyses with tearing away of the central end of the nerves. The pain persisted in 1918 with extreme hyperesthesia of the skin in the region of the 4th, 5th, 6th, 7th and 8th dorsal. On examination we were struck by a pronounced vasoconstriction of the entire left upper extremity, constant in every series of the examination. Veins less visible, hypothermia (18° C. on the back of the left arm as over against 25° on right); systolic pressure equal in the two humerals, arm oscillations of Parhon clearly reduced in left (4 divisions at the wrist as against 8 divisions on the right); arterial pressure (according to Gaertner) 9 at left against 13 at right. After local hot bath (test of Babinski and Heitz) the oscillations and the arterial pressure became equal on both sides. No

modification of the reflex in electric reactions. No pupillary disturbances nor vasomotor disturbances of the face. Nothing as regards the heart. One may conclude from these observations that the vasomotor fibers in the upper limbs have their origin in man in the spinal segments D 4 to D 8 and that the vasomotors of the face and the dilator fibers do not arise lower than D 3. Further the existence of vasomotor disturbances limited in this manner have permitted us to scatter the idea of a purely hysterical hyperesthesia and to conclude with certainty that there is an irritation of the root and the corresponding spinal segments. [Author's abstract.]

Barlocco. CHANGES IN CARDIOVASCULAR SYSTEM AFTER EXERCISE. [Riforma Medica, October, XXXVII, No. 44.]

The modification of the size of the heart, the character of the pulse and the blood pressure in average healthy individuals, in those with compensated heart disease, and in those with cardiac neuroses, after muscular work, extra exertion or fatigue, is here discussed. Epinephrin and atropin in these various conditions are investigated as to their pharmacodynamic action and the results in vagotonia and sympatheticotonia are compared.

Sicard, M. J. A. TREATMENT OF MIGRAINE BY INTRAVENOUS INJECTIONS OF CARBONATE OF SODA. [Soc. Méd. d. Hôp., July 21, 1921.]

Sicard, with Paraf and Forestier, advocates this treatment for migraine on the hypothesis that migraine is due to disturbance of the humoral equilibrium in classic colloid form. Certain exogenous substances (alimentary) or endogenous ones (menstrual) incompletely transformed or adapted to the blood thus provoke the humoral disturbance. Why the tissues of the cranial region or of one side of that region are elective for the disturbance is still in darkness. The sympathetic system undoubtedly plays a large part in the reactions. The tissues of the spinal cord as well as of the cranial region may be involved for crises of lumbago occur from the same causes and under the same conditions as those which produce the cranial crises. The spinal crises also respond similarly to injections of carbonate of sodium. This treatment is effective where other means fail, it is given without danger, it is alkaline and further its administration does not interfere with ordinary activity. It may be employed favorably also in asthma, urticaria and in prurient affections. Its action has been observed even in epilepsy. The technic of administration is as follows: No food is taken in the morning. Injection is made between 7 and 10 o'clock. Ordinary artificial serum of sodium chlorid 8 p. to 1,000 of distilled water is used, also, a capsule containing 0.50 centigrams of carbonate of sodium, and one containing 1 gram carbonate of sodium hydrated in 10 cm³ distilled water. The solution, which can be easily prepared just before treatment, is given in the quantity of 50 to 66 c.c. of the artificial serum with 50 centigrams of carbonate of

sodium in order to test the subject's tolerance. The doses may be increased rapidly until 1 gram or 1.50 grams of the carbonate of sodium in 100 cm³ of the serum is given. Two grams in 130 cm³ is the highest dose that the author has given.

Usually two intravenous injections a week are given at intervals of two or three days for about a month or a month and a half. The crises have then disappeared completely or diminished remarkably. Sometimes the treatment must be repeated after some months when weekly injections suffice. In two cases the migraine would not yield to this treatment or any other. The injection is followed in many cases by a temporary reaction colloidal in nature, trembling, sometimes slight chills, chattering of the teeth and nausea. This reaction terminates quickly without ill effect. It does not appear in all cases although it probably represents the humoral effect produced by the injection of the carbonate of sodium. For the latter modifies the blood plasma, destroys the dyscrasia and reestablishes the normal equilibrium of the organism. [Author's abstract.]

Rocaz and Lartigaut. A MIXED FORM OF PRIMARY MYOPATHY. [Gaz. Hebd. des Sci. Méd. de Bordeaux, 1921, XLII, 44.]

The writers have shown a child of eight years who at first sight seemed to be a case of the classical facio-scapulo-humeral type. But in the recumbent position one finds atrophy of the spinal muscles leading to lumbar lordosis, with placidity of thoracic muscles, and atrophy of the pectoral and abdominal muscles. Thus we have here a combination of the Landouzy-Dejerine type with Zimmerlin's thoracico-abdominal type of myopathy. While the glutei are preserved, there is very marked atrophy of the quadriceps, and slight but definite atrophy of the antero-external leg-muscles, especially the right, leading to deviation of the right foot in varus and a diminution in volume of the lower limb. One may regard this atrophy of certain leg-muscles as an abnormal, incomplete, and localized form of the Leyden-Möbius myopathy. In this patient there is galvanic hypoexcitability of the affected muscles without reaction of degeneration, and the Wassermann reaction is negative. [Leonard J. Kidd, London, England.]

Péhu and Bonafé. PROGRESSIVE ATROPHIC MYOPATHY IN TWO BROTHERS AGED TWO YEARS AND FIVE YEARS. [Lyon Médical, CXXXI, April 10, 1922, p. 304.]

The writers report to the Medical Society of the Lyons Hospitals the cases of two brothers, aged two and five years respectively, who were affected with a peculiar form of myopathy. Their parents were first cousins. The younger boy showed atrophy of the muscles of the lumbar region and of the lower limbs, especially of their proximal segments. There were no hypertrophic masses, no R. D., no fibrillary contractions, no sensory changes, and no sphincter troubles. The elder boy showed

much the same condition. In the younger boy the disease probably began during the first months of life, in the elder towards the age of five years. By the characteristic objective signs, notably the absence of reaction of degeneration, the disease must be connected with the Leyden-Möbius type of myopathy. But its very early appearance, at any rate in the younger boy, allies it to the Werdnig-Hoffmann variety. [Leonard J. Kidd, London, England.]

Carey, E. J. EXPERIMENTAL TRANSFORMATION OF SMOOTH MUSCLE INTO STRIATED MUSCLE. [Am. Journ. of Physiology, November 1, 1921, LVIII, No. 1.]

The evidence presented by Carey tends to show that the structure of striated muscle is determined by the function it performs and the work it does, and that cross-striated muscle is not formed in anticipation to a future function. The pale bladder musculature may be transformed histologically into the red, cross-striated type by increasing the tensional stimulus to a degree comparable with that which the cardiac mesenchyme experiences normally and physiologically, into an organ manifesting rhythmicity as long as the hydrodynamic stimulus is applied. [J. A. M. A.]

Stone, C. A. AMYATONIA CONGENITA. [Jl. Bone and Joint Surgery, January 1922.]

Various men have found at autopsy in such cases a condition described as regression of the muscles affected and changes in the anterior horn cells. The case reported is rather typical of the majority of the cases hitherto described. No attempt to give an exhaustive résumé of the literature was made. The patient was seen because of curvature of the spine and paralyzed legs. Family history negative. Breech delivery at birth. Foetal movements during pregnancy were not so vigorous as was true for the other children. He did not kick his legs from the beginning. A doctor who was called pronounced it infantile paralysis. The same diagnosis was made on first admission to the St. Louis Children's Hospital, February 8, 1917. There was incontinence of urine and feces. For the past several years he has had control of his rectal sphincters. The boy was healthy. There was a contracture of the tensor fascia femoris to relieve which a lengthening was done March 3, 1917. Physical examination May 14, 1920, showed lower extremities almost totally flaccid, only slight power in adductors of thighs, legs short, adipose and flabby without the usual signs of atrophy. Toes deformed and irregularly placed in extension. Plantar surfaces of the feet are full of wrinkles and resemble large pads. Marked hypermotility of knees. The Dorsum of feet can be placed on the anterior surfaces of the legs. Both feet can be placed behind the head at the same time. The left knee can be placed behind the left shoulder. Each thigh can be placed alongside the

body. Neurological examination states the absence of sensory findings and says it is either an acquired process or a developmental defect in the anterior horn cells of the lumbar and sacral segments.

This is thought to be a true case of amyotonia congenita because of the flaccidity, the little sign of muscle atrophy and the presence of paralysis at birth. Contractures have been noted in other cases but no loss of sphincter control. It is not a myopathy because there is no progressiveness, no wasting. It is not a birth injury because the neurological findings would be different. Only one older case has been reported. [Author's abstract.]

Corson, J. F. MYOPATHY IN A NEGRO. [Journal of Tropical Medicine and Hygiene, September 1921, XXIV, No. 17.]

This is a clinical report of a myopathy occurring in a negro boy, aged eighteen. The onset was acute following closely after a fall shortly before puberty. The right arm above the elbow was first affected, and his voice was lost. Erb's juvenile type of myopathic muscular atrophy was the syndrome.

McClanahan, H. M., and Willard, W. W. OSTEOGENESIS IMPERFECTA CONGENITA. [American Jour. of Diseases of Children, March 1920, XIX, No. 3. J. A. M. A.]

The study of the bone in the case reported by McClanahan and Willard showed evidence that the osteoblasts rising from vascular fibrous bone marrow, because of insufficient nourishment or some toxic influence, did not develop properly, but remained polygonal and later underwent metaplasia into osteoblasts. The patient was only three months old. Death occurred from exhaustion. According to the authors, this patient is the youngest dying from this disease on whom a necropsy was performed with subsequent histologic study of the bones. A complete report of the findings is made.

Mackenzie and Baldwin. LOCAL DESENSITIZATION IN HAY FEVER. [Archives of Internal Medicine, December 1921, XXVIII, No. 6. J. A. M. A.]

Observations are reported by Mackenzie and Baldwin which indicate that in individuals manifesting cutaneous hypersensitiveness, the reactivity of the skin may be abolished locally by repeatedly applying to the same skin area the substance to which the individual is hypersensitive. The reactivity of the skin at the exhausted site may not return for three days, or perhaps longer. The exhaustion appears to be specific. The extent of the area of the exhaustion is strictly limited to the site of the reaction. The nonspecific cutaneous reaction produced by the non-antigenic substance histamin is not only inexhaustible but progressively increases with each repetition of the application to the same site. The

possibility that the results reported indicate a genuine local desensitization is discussed. The bearing of the results on the treatment of hay fever and other forms of allergic rhinitis is discussed.

Aldabalde. EPINEPHRIN IN MUSCULAR DYSTROPHY. [Siglo Médico, July 1921, LXVIII, No. 3525.]

This clinical therapeutic paper deals with the action of epinephrin in muscular dystrophy. The shoulder and leg muscles had become very weak presenting a pseudohypertrophic dystrophy of the Duchenne-Griesinger type. Epinephrin was given systematically, with massage and electricity. Great improvement was realized, the patient soon could walk without crutches, and, although the muscles tire readily, seems normal.

Crivelli, L. HEREDITARY POLYDACTYLISM. [Med. J. Australia, August 28, 1920.]

Crivelli here reports a case of hereditary polydactylism, extending through five generations. A woman had three children. One girl had an extra digit on one side; one boy had no extra digit; and one girl had a double deformity. The woman herself had the double deformity as did also her three sisters, three brothers negative and one brother with an extra digit on one foot. One of the sisters has a boy with the deformity. One brother has one or two normal children. The father, grandfather and great-grandfather of the patient in question had the deformity.

Klippel and Weil. VITILIGO. [Rev. Neur., August 1920, XXVII, No. 8.]

Vitiligo as developing by metamerism is here described. Hence the assumption is that the commissural fibers in the cord are involved in this disorder. In one patient, aged twenty-seven, there were several nevi and each was surrounded by a patch of vitiligo. In this case also the distribution of the vitiligo corresponded to definite metameric segments.

Stransky, E., and Weber, O. OBSERVATIONS UPON THE PATHOLOGICAL CONSTITUTION IN THE EXUDATIVE DIATHESIS.

After-investigation in the case of exudative children who at the nursing period had undergone treatment at the Charité-Poliklinik in Berlin. The children at the time of the after-examination were of the ages from seven to fourteen years. In 29 children there still existed affections of the skin, in 38 these were absent. The persistent skin affections were: 1. prurigo mitis, 2. neurogenic eczema (neurodermatitis, neurogenic dermatosis), 3. more rarely urticaria. One frequently observed a dry skin even without prurigo. More than a fourth of the cases investigated furnished certain signs of hyperplasia of the lymphatic pharyngeal ring. Bronchial asthma was present in five cases. Two of the five

cases had urticaria, Two neurogenous eczema. Half of the children investigated showed neuropathic symptoms which were as follows: "Dermographia, umbilical colic, pains in head and stomach, facial phenomena, positive Aschner, disturbances of sleep, pavor nocturnus, labile temperament, irritability, excited states, fidgety, excitable natures, absence of vomiting reflex" in varying combinations. There was no connection between the permanence of the skin symptoms and the neuropathic constitution. The contrast between the exudative diathesis and erythrodermatitis was striking. In 11 of the children studied those skin symptoms were absent which had already finally disappeared in the nursing period. At the time of investigation there remained a large number "in whom the abnormal reactions to normal stimuli even at the later periods called forth morbid symptoms." [Authors' abstract.]

Léri. UNILATERAL HYPERTROPHY OF SKULL BONES. [Bull. d. 1. Soc. Méd. des Hôp., October 29, 1920, XLIV, No. 32.]

This term is here applied to congenital hyperostotic deformity limited to one half the skull. The trigeminal nerve distribution and the involved areas are parallel. In the few cases on record an intracranial tumor developed, an angioliathic sarcoma of the dura. Léri's case belonged to this category. The vision is imperfect on the side of the hyperostosis, and the eye movements are interfered with. In this group of cases the tumor did not manifest itself till in the twenties, so he discusses whether there is a probability of a tumor developing later in this boy of ten years of age.

Pusey, W. O. BORDERLINE CASE OF NEUROTIC EXCORIATION. [Arch. Derm. and Syph., September 1920. J. A. M. A.]

Pusey reports a case in which the amount of destruction of the skin equaled that in many cases of typical malingering, but in this case the psychic condition was that seen in neurotic excoriations. He suggests that it may, perhaps, be regarded as a borderline case between the two conditions.

Marin Amat, M. OPHTHALMOPLAGIC MIGRAINE. [Siglo Médico, August 20, 1921, LXVIII, No. 3532.]

This paper records the clinical history of a woman twenty-nine years of age who had occasional attacks of vomiting and a more or less persistent pain in the left side of the head and eye for three months. The pain came on each morning about 9 or 10 and later became almost continuous. Vision in the left eye became less distinct, pupil dilated, and ptosis of the eyelid developed. Total blindness in two months occurred and in the course of the following three years she became demented, had muscular contractions and a cardiopathy. The etiological factors are not revealed. A second, insufficiently analyzed case was given milk injections with some relief of pain.

II. SENSORI-MOTOR NEUROLOGY.

1. CRANIAL NERVES.

Byrne, Joseph. PARADOXICAL PUPIL DILATATION FOLLOWING LESIONS OF THE AFFERENT PATHS. [Am. Jour. Physiol., 1921, Vol. LXVI, No. 113.]

FURTHER STUDIES OF PARADOXICAL PUPIL DILATATION, ETC. [Am. Jour. Physiol., 1922, Vol. LXVI, No. 369.]

Since Budge first reported the phenomenon in 1855 many observers including Schiff, Kowalewsky, Braunstein, Lewandowsky, Langendorf, Anderson, and Meltzer and Auer have reported paradoxical dilatation in the homolateral pupil following lesions in the course of the cervical sympathetic from the origin of its preganglionic fibers in the upper thoracic cord to the postganglionic fibers in the long ciliary nerves. Because the pupil, on the side upon which the efferent dilator paths had been severed, exhibited greater power of dilatation than its fellow, Langendorf called the phenomenon paradoxical pupil dilatation. None of the observers quoted and none in the author's recollection adverted to the possibility that paradoxical effects might be induced by lesions of the afferent paths. Byrne has found that lesions such as section, ligation, infection, alcoholic injection, etc., of one sciatic nerve were followed, after a period of incubation averaging about ten or twelve days of hypersensitization to adrenalin, etc., of the pupil-dilator mechanism of the contralateral eye. After similar lesions of the brachial plexus the period of the incubation was shorter (about eight days) and the paradoxical effects occurred in the homolateral eye. It was found finally that lesions of any of the cranial or spinal sensory nerves induced paradoxical sensitization in the related pupil. After section of one sciatic nerve paradoxical effects appeared in the contralateral eye about the twelfth day regardless of whether the divided nerve ends had been sutured together or not. It was found, however, that after the paradoxical period had passed off which, in the absence of infection, usually occurred from the fifteenth to the thirtieth day, it could readily be reinduced by injury of the proximal segment of the divided nerve. After section or injury of a sensory nerve, *e.g.*, the sciatic, the neurone bodies of the injured axones exhibit phenomena indicating suspension of function (axonal reaction phenomena, retrograde degeneration). These reach their maximum about the fourteenth or fifteenth day, sooner or later, depending upon circumstances, when the neurone bodies begin to exhibit changes indicating restoration of function. These changes take place in the proximal portions of the injured neurones whether the divided nerve ends have been sutured together or not, and there is evidence that at this stage, and later on, the regenerating neurones hyperfunction. The appearance and disappearance of the paradoxical period after sciatic section, etc., coincides with the

onset and disappearance respectively of axonal reaction phenomena. These and other facts warrant the conclusion that after sensory nerve injuries the appearance and disappearance of the paradoxical period are conditioned respectively by the suspension and restoration of specific neural functioning in the related neurone bodies within the dorsal root ganglia. In the later studies it was found that the severance of nameless nerve twigs incidental, *e.g.*, to the operation for exposure of the brachial plexus, was in itself sufficient to induce a true paradoxical condition which, however, was of much shorter duration than the paradoxical period induced by severe lesions of large nerve trunks. It is well known clinically that in the regeneration period after nerve injuries the incidence of cold weather may be followed by marked retrogression of returned sensibility. This was paralleled in some of the animals in which the paradoxical period, after it had disappeared, was reinduced by a spell of zero weather.

An intimate functional relationship exists between the efferent portion of the pupil dilator mechanism and every portion of the periphery through the medium of the sensory nerves. This relationship has important clinical significance since unilateral lesions of the sensory nerves are attended by well marked inequality which in general follows the rule found for paradoxical dilatation. Because of this relationship great care must be taken to give due consideration to lesions of the sensory nerves in interpreting the significance of pupil inequality in surgical and medical conditions. Compare the Klumpke-Dejerine sign. In these studies, which included numerous transections, hemitransections and electrical tests of the cervical cord, nothing was found to substantiate the existence of a special cerebrospinal dilator pathway apart from the continuations of cranial and cervical afferent paths making their way to Budge's inferior ciliospinal synapse. [Author's abstract.]

Brabant, V. G. NYSTAGMUS AND EQUILIBRATION. [Archives Médicales Belges, April, 1921, Vol. LXXIV, No. 4. J. A. M. A.]

Brabant is chef du laboratoire de psychophysiologie of aeronautics in Belgium, and his experience and research have convinced him that the balancing sense is in the eyes rather than in the internal ear. The external muscles of the eyeballs—their variable state of contraction corresponding to the modes of the balancing of the eyeballs—seem to be, he says, the principal peripheral organs of equilibration. All the physiologic findings conform to this.

Shumway, E. A. TRAUMATIC SUPERIOR OBLIQUE PARALYSIS. [Penn. Med. J., June, 1921.]

A man of thirty-eight sustained a fractured skull which was followed by a paralysis of the left superior oblique. Ten months later 23° of left hypophoria and 3° of exophoria was still present. For the relief of these cases four possible procedures are suggested, advancement of the paretic

muscle, tenotomy of its antagonist, tenotomy of its associate in the other eye and advancement of the antagonist of this associate. In the present case the author adopted the third method—tenotomy of the associate of the other eye, which in this patient was the right inferior rectus muscle. This would establish equilibrium by making the lowering of the healthy eye more difficult and elevation easier. The result was good, with a low degree of hyperphoria. Probably advancement of the inferior rectus of the same eye would be a safer procedure.

Fallas, A. AVELLIS' SYNDROME ASSOCIATED WITH PARALYSIS OF THE FACIAL AND THE OLFATORY NERVE. [Rev. de Laryngol., d'Otol., et de Rhinol., January 15, 1921, p. 27.]

Fallas reports a case of Avellis' syndrome associated with paralysis of the facial and the olfactory nerve. The patient, aged thirty-four, had in the course of a few days a paralysis of the right half of the velum palati and larynx with violent pains in the right half of the head and the right ear, with severe pains on swallowing, probably due to herpetic vesicles on the epiglottis. These disappeared under aspirin in a few days. The reaction of Bordet-Gengou was negative. Nine days after the first examination a right facial palsy appeared and rapidly became complete; at the same time there was loss of taste and smell. In spite of an injection of 13 c.grm. of sulpharsenol the reaction of Bordet-Gengou remained negative in the blood, but the facial and palatal palsy improved. Taste and smell reappeared after intramuscular injections of sulpharsenol: 0 grm. 12, 0 grm. 24, 0 grm. 30, 0 grm. 36. This treatment is being continued. [Leonard J. Kidd, London, England.]

Holmes, G. PALSIES OF CONJUGATE OCULAR MOVEMENTS. [Br. J. Ophth., June, 1921.]

Conjugate movements of the eyes result from voluntary impulses and may occur as reflex movements from various peripheral stimuli. These conjugate movements, says Holmes, are governed through cortical and subcortical synaptic areas (centers). The best known cortical zone is the second-frontal. An irritant lesion of this region excites clonic conjugate movements to the opposite side; destruction of the region, as by gunshot wounds, produces weakness and slowness of conjugate movements to the opposite side. The angular gyrus has been described as a second cortical center, but the author considers the special disturbance of ocular movements in lesions of this region to be more of the nature of apraxia—that is, failure to obey an order to look in any direction. A third center has been claimed for the visual area of the occipital lobe, but the movements of the eyes elicited from it are more truly reflexes from the production of visual perceptions, just as in hemianopia there is a transient deviation of the eyes away from the hemianopic side. Diseases of the brain stem produce the most complete and permanent disturbance of the conjugate movements of the eye. A lesion in the region of the left

abducens nucleus may make the patient unable to move either eye to the left of the middle line, showing that the right internal rectus is also affected. It is necessary to assume that the nuclei are connected by association fibers, such as those of the dorsal longitudinal bundle. But the hypothesis that assumes the existence of a supranuclear center near the sixth nucleus is probably more correct. Into it come all the impulses which can excite conjugate movements of the eyes to the same side, both voluntary and reflex. Destruction of it abolishes all lateral conjugate movements. Convergence movement of the internal rectus muscle may still persist. Conjugate vertical movements also possess a supranuclear mechanism which is probably situated in the anterior quadrigeminal bodies.

Gurdil. OCULAR DISTURBANCES COMPLICATING OTITIS MEDIA. [Paris Thesis, 1921.]

Ocular complications occurring in the course of otitis media are paralysis of the sixth nerve (9 per cent) and papillary stasis, with or without neuritis, 60 per cent. The paralysis is encountered particularly in those cases of otitis with intracranial complications: The immediate causes are diverse: Foci of circumscribed meningitis, cerebellar abscess, thrombophlebitis. Cases have also been observed without intracranial complications; the pathogeny of these is difficult of explanation: In these, too, quite probably there is some affection bearing directly upon the nerve. The alterations of the optic nerve observed in the course of otitis, present themselves under two forms: Simple papillary stasis, unaccompanied by immediate signs of disturbance of function in cases where ventricular hypertension is alone present; stasis with neuritis and rapid failure of vision, when to the ventricular hypertension is added a meningeal infection along the sheath of the optic nerve. Systematic examination of the fundus in the course of otitis media accompanied by general symptoms will alone render possible the detection of such alterations of the optic nerve. Treatment depends upon early diagnosis; good results are obtained in papillary stasis particularly. Lumbar puncture will be of service in cases of slight hypertension; it must be repeated several times. In cases of hypertension with papillary stasis, recourse must be had to decompressive craniectomy; to be effective intervention must be made before the process has proceeded to atrophy. In stasis with neuritis, vaccinothérapie is of prime importance where it has been possible to isolate the infectious germ.

Kearney, J. A. THE OCULAR FACTOR IN HEADACHE. [New York Medical Journal, November 16, 1921.]

The symptom for which an ophthalmologist is most frequently consulted is headache. The ocular factor in all forms of headache is greater than is generally supposed, probably not less than 40 per cent, while of all bilateral frontal headaches, 75 per cent are due to eyestrain. The

site of the headache when eyestrain is responsible, is often leading as to the character of the existing error of refraction. The character of the headache is usually dull, seldom knifelike. At a time when a patient is much reduced in health, or is convalescent from a long standing or febrile disease or a major surgical operation, asthenopic (eyestrain) symptoms or other remote distresses, the result of errors of refraction are apt to become manifest. Examination at this time under a mydriatic is advisable, and when there is found an error of refraction or extrinsic muscular imbalance, relief is usually experienced when they are corrected. Quite frequently a patient suffers from headache that has every semblance of that due to eyestrain with no external evidence of inflammation, and upon examination and tests has no refraction error present. In a number of these cases, by turning the lids and carefully scrutinizing the conjunctiva, it may disclose changes from loss of luster to decided disease. Headache due to glaucoma, iritis, keratitis, conjunctivitis and other diseases that attack the eye structures and adnexa are readily recognized as presumably causative by the affection when found. A careful ophthalmoscopic examination of the fundi of the eyes is imperative in every patient who complains of headaches that are persistent and uncontrollable. By such examination many of the brain tumor cases admitted to our hospitals disclosing choked discs are diagnosed as such for the first time. An ophthalmoscopic survey of the fundi of the eyes often discloses changes in the structures that suggest anemias, arteriosclerosis, toxemias and other dyscrasias which might be held accountable for headache. [Author's abstract.]

2. PERIPHERAL NERVES.

Van Valkenburg. RADICULAR ATHETOSIS. [Ned. Tijds. v. Gen., December 24, 1921, Vol. II, No. 26.]

A clinical report of two cases in men of twenty-six and forty-two years of age. There was a pronounced tremor in the arm although the isolateral side was involved. He analyzes these and similar cases on the basis of a kinetic anesthesia.

Heile, B. OUTCOME OF OPERATIONS ON NERVES. [Beit. z. klin. Chir., 1921, Vol. CXXIV, No. 3. J. A. M. A.]

Heile describes the present status of 87 out of 300 nerve operation cases, with an interval since of over thirty months. In 25 per cent the operation has proved a complete failure, no improvement being evident from the partial or total resection or neurolysis. The outcome in the neurolysis cases has proved particularly disappointing. Only 25 per cent have been cured completely, 50 per cent are only more or less improved. Shifting the nerve into sound tissue proved useful, but seldom is practicable. A calf artery used to isolate the nerve soon became disintegrated, and fascia tissue did not give durable protection. Fat proved better

adapted for the purpose. Drain tubes also long persisted without disintegration. Very encouraging are the excellent results realized in two cases in which four and later two more posterior roots were resected in the sciatic region, after failure of other means to relieve the intense pains. Some colored photomicrograms show among other things the importance of the sympathetic fibers found in peripheral nerves.

Winterstein. UNILATERAL PARALYSIS OF DIAPHRAGM. [Mit. a. d. Gon. d. Med. u. Chir., 1921, Vol. XXXIV, No. 2.]

A unique clinical case of paralysis of one-half of the diaphragm with paralysis of the brachial plexus. The author collects six other cases from the literature with which he compares his case.

Páez, F. R. BERIBERI IN VENEZUELA. [Gaceta Médica de Caracas, July 31, 1921, Vol. XXVIII, No. 14. J. A. M. A.]

This address delivered by Páez at a recent national Venezuelan medical congress, reviews the present status of our knowledge of beriberi, and its incidence in Venezuela. Until the last ten years it had been endemic in Ciudad Bolívar, for instance, causing from four to thirty-nine deaths each year, but since 1912 the number has been only two to four, and no cases were reported in 1920. He has seen cases run a fatal course in a few hours; the cases with heart complications are especially grave. Vomiting is an unfavorable sign, particularly when there are girdle pains. Beriberi seems to be a deficiency disease in Asia, but in Venezuela rice is not eaten much, and the diet is varied, and beriberi affects the well-to-do, and contagion of persons sleeping in the same room is common. Recrudescence in the rainy season is the rule, and initial fever is frequently observed. Another feature of beriberi in Venezuela is that a change of residence, even from one part of the town to another, often is followed by prompt recovery. Physicians in Venezuela are inclined to accept beriberi as an infectious disease. It was imported for the first time in 1885. De Milita reports the case of a previously healthy young clerk who recovered promptly from beriberi when taken to a mountain resort, but it recurred and proved fatal on return to the former sleeping room, damp, and lacking sunlight. A recurring attack of beriberi is usually graver than the first. He has been applying heliotherapy in treatment of beriberi since 1915, and has always obtained satisfactory results. Hot sand baths are also useful. His observation has convinced him that infection occurs through the feet, and in prophylaxis he insists on the footwear being long exposed to the sun.

Riosalido. TENDON TRANSPLANTATION FOR RADIAL PARALYSIS. [Archives Espanoles de Pediatriá, April, 1921, Vol. V, No. 4.]

This well illustrated and carefully worked out paper sets forth the technic and outcome of transplantation of the tendons of the flexor muscles to counteract radial paralysis. The flexors are transplanted and

then trained to extension. The case reported, that of a boy of sixteen, showed marked success. The paralysis resulted from an osteomyelitic focus in the humerus, with fracture of the bone. Jones' technic, severing the muscles through an incision on the palmar side was followed. The proximal stumps were brought on the dorsal side and sutured to the extensors.

Huber, E. OPERATIVE CORRECTION OF MEDIAN PARALYSIS. [*Deutsche Zeitschrift für Chirurgie*, May, 1921, Vol. CLXII, Nos. 3-4.]

This surgeon has been able to restore function to the thumb and forefinger by suturing the abductor muscle of the little finger to the flexor of the thumb. He makes two incisions. One is parallel with the little finger and the other axial to the thumb. The forefinger was controlled by transplanting the abductor of the thumb to the tendon sheath of the flexor profundus of the forefinger.

Iuspa, V. NEUROFIBROMATOSIS. [*Riforma Medica*, April, 1921, Vol. XXXVII, No. 18.]

A clinical report of a case of diffuse neurofibromatosis coincided with flaccid paralysis. Wassermann was positive. Arsenical treatment was begun and the nervous symptoms were cured.

Tupas, A. V. BERIBERI IN PHILIPPINES IN 1920. [*Phil. Islands Med. Assn. Journal*, May-June, 1921, Vol. I, No. 3. J. A. M. A.]

Out of thirty-six admissions to the hospital, thirty were under three months of age. The youngest patient was fourteen days old and the oldest was one year and five days old; the latter belonged to the pseudomeningitic form. There were eleven deaths, or a mortality of 30.5 per cent. Roentgen-ray findings were noted in sixteen cases, fourteen of which showed enlargement of the heart to the right, and two to the left. Of the eleven fatal cases, a necropsy was made in five. The constant lesions found were dilatation of the heart, the right ventricle being about three times as large as the left; hydropericardium; punctate hemorrhages in the lungs; passive congestion of the liver, kidney, and spleen; and degenerative neuritis of the vagus nerve.

Monrad-Krohn and Lossius. INVERSION OF THE PLANTAR REFLEX DUE TO LESION OF PERIPHERAL NEURONS. [*Norsk Måg. f. Laeg.*, November, 1921.]

The response of the normal plantar reflex is, as far as the big toe is concerned, chiefly due to contraction of flexor hallucis brevis, abductor hallucis and adductor hallucis (oblique head). The authors describe two cases of poliomyelitis where these muscles were paralyzed, whilst the extensors were only slightly paretic—and where in consequence hereof the plantar reflex gave a typical extensor response, quite like the response seen in pyramidal lesions.

In the recorded cases there were no other pyramidal signs and the authors feel convinced that the inversion of the plantar reflex was solely due to the lesion of the anterior horn cells causing a paralysis of the above mentioned muscles. It has to be remembered that the normal plantar response is due to the cerebral reflex mechanism overpowering the original medullary reflex mechanism with extension response. When for any reason the former is put out of action the latter appears.

Thus even in regard to the Babinski phenomenon, which is as a rule such a reliable indication of pyramidal lesion, the old dictum holds good: "Signum unum, signum nullum." It can be simulated by a peripheral lesion and may, without a detailed and systematic clinical investigation, lead to diagnostic errors. [Author's abstract.]

Miller, M. K. POLYNEURITIC SYNDROME IN YOUNG CHILDREN. [Indiana State Medical Association Journal, March 15, 1921, XIV, No. 3, J. A. M. A.]

A case exemplifying a "polyneuritic syndrome" is presented by Miller. The predominant symptoms consist of listlessness combined with extreme restlessness, rapid loss of weight, profuse perspiration, necrosis of gums and alveolar processes with loss of teeth, swollen, tender, cold, bluish-red fingers and toes with maceration of the skin over them, and diminished reflexes. The picture was associated with slight fever, leukocytosis, and suggested the result of an infection.

Harris, R. I. TREATMENT OF IRREPARABLE NERVE INJURIES. [Jl. Can. Med. Assoc., November, 1921.]

The increasing amount of knowledge resulting from experience in the large number of nerve injuries sustained during the war, points to end-to-end suture as the only treatment of value for severed nerves. However, it is not always possible to attain end-to-end suture, nor when it is attained is a perfect result obtained in every case. Such cases may be termed irreparable nerve injuries. Examination of the cases which have failed to recover after suture show two important causes of failure and several minor causes. The two important causes are (a) separation of the sutured segments of the nerve after suture, because of excessive tension at the site of suture, and (b) the sidetracking of motor fibrils down sensory paths and vice versa because of our inability accurately to match the nerve pattern of the distal to the proximal segment. If there is any evidence (*e.g.* a demonstrable neuroma) that the first cause has prevented recovery, or if there is a reasonable possibility that this may have been the cause of failure, the nerve should be reexplored and a re-suture performed if necessary. It is quite likely that recovery can take place even after long periods of severance.

All the available evidence points to the complete failure of gap bridging operations in the treatment of severed nerves whose segments cannot be brought end to end. Such nerve injuries are irreparable as

far as treatment directed to the nerve is concerned. Improvement can be obtained however by tendon transferences and tendon fixations, and in certain situations by nerve anastomoses. In musculospiral injuries tendon transferences have given brilliant results. The function of the hand can be restored almost to normal by implantation of the pronator teres into the extensoris carpi radialis longus and brevis; the flexor carpi radialis into the extensor digitorum communis and the palmaris longus into the extensors of the thumb. Such an operation results in improvement in almost 100 per cent of cases—and in most of these the result is so good as to approximate normal. In median injuries the great obstacle to attempts at palliative treatment is the anesthesia of the index and middle fingers and thumb. Unless this is overcome tendon transferences to restore movement no matter how brilliant, will be useless. There is hope that this anesthesia may be relieved by nerve anastomosis. In one case median anesthesia was completely relieved by implanting the proximal segment of the radial nerve into the distal segment of the severed median nerve. In attempting to overcome median paralysis by tendon transferences the two important problems are to restore opposition of the thumb and to restore flexion of the fingers and thumb. Opposition of the thumb can probably be restored best by suture of the palmaris longus to the cut off distal end of the extensor pollicis longus (Day's operation). Flexion of the fingers can be restored by implantation of the supinator longus into the paralyzed tendons. Irreparable ulnar lesions do not lend themselves to palliative measures and so far no reasonably successful means has been devised to improve an irreparable ulnar lesion. In irreparable sciatic lesions tendon fixations after the method of Gallie have given better results than tendon transferences. This probably results from the fact that in the leg the important function is stable weight bearing rather than movement. Tendon fixations correct deformities and permit balanced weight bearing in a fashion that tendon transferences do not. [Author's abstract.]

Bolten, G. C. POST-INFLUENZAL ORGANIC AFFECTIONS OF THE NERVOUS SYSTEM. [*Nederlandsch Tijdschr. voor Geneeskunde*, LXVI, June 10, 1922, p. 2255.]

The central nervous system is undoubtedly very sensitive to the toxins of influenza. In cerebral abscess and in all forms of encephalitis, while abnormalities of the cerebrospinal fluid may be absent, yet in most cases all sorts of variations of the spinal fluid are seen. It is pretty certain that at all times encephalitis lethargica has followed close on influenza epidemics. There are numerous transitional forms between typical lethargic encephalitis and other forms of influenzal encephalitis. Riese has drawn attention to the frequent signs of damage of sympathetic functions in immediate connection with an attack of influenza, such as low blood pressure, loss of hair, cyanosis of skin of hands and fingers, profuse sweats, acroparesthesiæ, etc. Bolten twice saw a cardiac neurosis

after influenza. Of the influenzal psychoses Bowman recognizes a catatonic and an amential; to these two Bolten adds a toxic delirium; this he has often seen during and after an influenzal attack. In these influenzal psychoses one repeatedly finds either signs of a slight encephalitis (strabismus, convulsions, slight paresis, etc.), or of meningitis (pleocytosis, positive reaction of Nonne). Bolten saw in a recent epidemic three fatal cases of influenzal meningitis that were indistinguishable from ordinary pneumococcal or staphylostreptococcal meningitis. Among the post-influenzal organic affections of the nervous system he records cases of cerebral abscess, an abscess beneath the sternomastoid muscle with a secondary neuritis of the nervous accessorius, a case of slight brachial plexus neuritis, one of a transverse myelitis of the thoracic spinal cord, one of a polyneuritis of the type of a Landry's paralysis, and a case of a polyneuritis of both legs (diplegia polyneuritica). Thus we must conclude, says Bolten, that the infection of influenza can give rise to all sorts of disturbances of the nervous system, and that widely separated parts both of the central and the peripheral nervous system are very susceptible to the virus of influenza. And most serious lesions of the nervous system can occur after quite slight or seemingly harmless cases of that disease. [Leonard J. Kidd, London, England.]

Viets. GLIOMA; REPORT OF CASE. [Boston Med. & Surg. Journ., February 10, 1921, CLXXXIV, No. 6.]

An interestingly analyzed case of glioma of the right temporal lobe. It was of the infiltrating type and largely replaced the tissues of the lobe without deforming the general brain contour. A large cyst was formed. The tumor extended to the base of the brain and medulla and then extended into subarachnoid space over a large part of the ventral surface of the brain. It also went down the cord to the conus terminalis without invasion of the central nervous system except a small portion of the left cerebellum. The medulla and cord were greatly compressed. Malignant glioma was the histological diagnosis.

Bolten, G. C. ASCENDING NEURITIS. [Nederlandsch Tijdschrift, January, 1921, I, No. 2.]

Upward extension of a neuritis the author considers rare. He describes what seemed to be a typical case, but an autopsy proved to be ascending tuberculous lymphangitis, involving the nerve roots.

Tinel, J. CAUSALGIA. [Presse Médicale, April, 1921, XXIX, No. 27.]

In this clinical paper Tinel describes the sympathetic algias which he affiliates with the mild forms of traumatic causalgia. The nerves the most frequently involved are those in which sympathetic fibers are richest. The features are distinctly sympathetic in their syndromy. Actual pains are replaced by a burning, a sense of oppression; pulsation of the blood wave is felt. In his five cases here recorded the disturbance was in the

thigh, leg or hand and in one case in the neck and face. Treatment is usually disappointing. Potassium iodide and calcium chlorid in a few cases in which vascular spasm were also present seemed to help. These algias, although undoubtedly due to somatic lesions in the vegetative fibers nevertheless are susceptible to psychotherapeutic efforts.

Turco, A. TREATMENT OF CAUSALGIA. [Policlinico, March, 1921, XXVIII, No. 3, J. A. M. A.]

In Turco's case of causalgia after severing of the median nerve, no benefit followed neurolysis, but decortication of the humeral artery for a stretch of 7 cm. restored clinically normal conditions. This success confirms Leriche's view that the perivascular network of sympathetic fibers is responsible for the disturbances.

Sargent, Percy. BRACHIAL PLEXUS LESIONS AND RUDIMENTARY RIBS. [Brain, 1921, Ed. B. M. J.]

This author's paper on lesions of the brachial plexus associated with rudimentary ribs, which contains an analysis of fifty cases operated upon, the majority having been traced for a period of two to twelve years, supplements his communication on this subject to the Clinical Section of the Royal Society of Medicine in 1913, and may with advantage be read in conjunction with E. Bramwell and Dykes' article on rib pressure and the brachial plexus recently commented upon. These cases are not very rare, but they have, no doubt, often been regarded as examples of brachial neuritis or neuralgia, uniradicular palsy, progressive muscular atrophy, occupation neurosis, writer's cramp, or symmetrical atrophy of the hands. But, as Sargent points out, it must now be remembered that cervical ribs may be found in persons presenting similar symptoms but due to entirely different causes, so that there is a risk that futile operations may be performed on patients suffering from syringomyelia, toxic neuritis, and other conditions wholly unconnected with a coexisting cervical rib. In the discussion of the relation between anomalies of the ribs and the nerves constituting the brachial plexus, he refers to his examination of the composition of the brachial plexus during operations on a number of patients with rudimentary ribs, and concludes that though there is generally some prefixation of the brachial plexus associated with cervical ribs, and some degree of post-fixation with abnormal first thoracic ribs, this relation is by no means constant, and that the form and size of the abnormal rib do not bear any constant relation to the composition of the plexus. Indeed, if the plexus were always prefixed for a complete segment when a well developed cervical rib is present, symptoms should be absent; this often happens, but, on the other hand, the frequency of cases of cervical ribs with symptoms relieved by operation shows that the modified anatomical relations do not always work out satisfactorily. Sargent confirms Bramwell's conclusion that with a post-fixed plexus symptoms referable to the first thoracic root

may be due to pressure exerted by a normal first thoracic rib. He finds that of the clinical forms of cervical rib that most often requiring operative treatment is represented by an abnormally large nonjointed costal process, continued onwards as a dense fibrous band to be attached to the first thoracic rib behind the sulcus nervi brachialis. He describes the symptoms as undoubtedly traumatic in origin; a sudden onset may be due to a strain, but the gradual appearance of symptoms results from the continued friction of the eighth cervical root or the lowest cord of the plexus caused by tightening of the band during respiration and movements of the arms; it is noteworthy in this connection that nearly all the patients were engaged in active work. The symptoms are grouped into those due to damage of (1) somatic afferent fibers—namely, neuralgic pain and disturbances of cutaneous and deep sensibility; of (2) somatic efferent fibers—namely, wasting, weakness, and alteration of electrical excitability in the affected muscles; and of (3) sympathetic fibers—namely, circulatory disturbances (coldness, cyanosis, edema) and certain paresthesias (tingling, numbness, and feeling of coldness or swelling). The so-called “vascular” symptoms are vasomotor in origin and due to injury of the sympathetic fibers shortly after their entrance into the eighth cervical and first thoracic roots; the only instance in which Sargent has seen the subclavian artery pass over an abnormal rib was in a case of a rudimentary first thoracic rib. Analysis of the 50 cases showed that pain was cured in 19 cases and relieved in 8. As Thorburn had stated in 1913 that he had never seen muscular wasting entirely cured, Sargent carefully criticized his 31 cases, and found that in 12 there was complete cure, in 12 incomplete improvement, and in 7 no improvement; the vasomotor symptoms were cured in 14 cases, relieved in 6, and not relieved in 2. Since the association of symptoms with cervical ribs has become generally recognized only in this century, it is interesting to note that Sargent has brought to light a case operated upon by Coote in 1861.

Souques and Bertrand. HISTOLOGY OF HYPERTROPHIC FAMILIAL NEURITIS.
[Ann. de Med., 1921, Vol. IX, No. 5.]

These authors have found in an extensive study of progressive interstitial neuritis of infants that the disease is due to a primary lesion of the sheath of Schwann, later followed by degeneration of the myelin sheath, and finally the axis cylinder becomes involved. The pathological process starts in the peripheral nerves and then passes on to affect the spinal cord. Motor and sensory fibers are involved. The change, which appears to be of an inflammatory nature, is first manifested by a proliferation of the nuclei and of the protoplasm of the neurilemmal sheath. As the proliferation continues vacuolation sets in, and a cross section of the nerve fiber at this stage shows a central axis cylinder surrounded by an enormously hypertrophied whorl of fibrils, separated by clear spaces—probably of myelin—and containing large numbers of nuclei. Ultimately extensive multinucleated plaques are formed, arranged like the coats of

an onion, and it is to these that the nerve fibers owe their extraordinary thickness. Later in the disease the spinal ganglia are affected, and from these the process passes upward to the cord, leading to degeneration of the posterior columns. The lesions of the motor regions of the cord, which are particularly marked in the dorsal region, are characterized by cytolysis of the anterior horn cells, disappearance of the Nissl granules, and perivascular infiltration of the nervous parenchyma with round cells.

Crouzon, Bouttier and Mathieu. PLEXIFORM NEUROMA. [Bull. d. 1. Soc. Méd. des Hôp., December 2, 1921, Vol. XLV, No. 35. J. A. M. A.]

The illustration shows the lumbar, buttocks and thigh regions the site of huge confluent tumors in the young woman. Besides these plexiform neuromas, there are neurofibromas and pigmented nevi completing the picture of Recklinghausen's disease.

Pastine. VALUE OF THE RADIO-EXTENSOR REFLEX. [Il Policlinico, Sez. Med., June 1, 1921. B. J. M.]

The author states that under normal conditions percussion of the upper half of the outer border of the radius causes not only a flexion of the forearm, but also a more or less marked extension of the hand. This reflex, which Pastine calls the radio-extensor reflex, is constant or almost constant in physiological conditions, and should be investigated in addition to the other principal reflexes of the upper limb—namely, the tricipital, radial, radio-pronator, and ulno-pronator reflexes. In ulnar paralysis the radio-extensor reflex is usually not affected, for obvious reasons. In median paralysis percussion causes a more marked extension of the hand than on the healthy side, and at the same time a more or less definite supination of the forearm and hand. In motor paralysis of the musculocutaneous nerve the radio-extensor reflex is preserved, while the ordinary radial reflex is lost. In musculospiral paralysis the radio-extensor reflex is lost, but if there is merely paresis it is only diminished. In Erb-Duchenne paralysis percussion of the radius does not cause flexion of the forearm because the fifth and sixth cervical roots are involved, but gives rise to extension of the hands because the seventh cervical root innervating the muscles on the dorsal aspect of the forearm is intact. In the median radicular syndrome in which the seventh cervical root is involved the radio-extensor reflex is lost for the reasons mentioned. In the Aran-Duchenne-Dejerine-Klumpke syndrome, in which the fifth, sixth, and seventh cervical roots are intact and the eighth cervical and first dorsal roots are affected, the reflex is preserved. The persistence or disappearance of the radio-extensor reflex, like the persistence or disappearance of the tricipital reflex, indicates immunity or involvement of the seventh cervical root by a morbid process. In addition to lesions of the brachial plexus, the reflex should be investigated in cervical tabes, syringomyelia, and various meningo-radicular cervical processes primarily or secondary

to vertebral changes (dislocation, fracture, Pott's disease, osteoarthritis, etc.) and affections of the cervical cord, especially tumors in which it is essential to determine the situation of the lesion in view of operation.

Lhermitte. THE REGENERATION OF PERIPHERAL NERVES. [Ann. de Méd., April, 1921.]

This critical review goes over most of the recent literature bearing on the subject of nerve regeneration from the newer viewpoints stimulated by the work of Dustin and his associates. This work indicates that the direction which is followed by the budding axis cylinders of the central end of the nerve is determined largely by the active proliferation of the cells of the sheath of Schwann around the peripheral end. There is formed a syncytium of growing cells from this end, into the meshes of which the regenerated axis cylinders find their way. The fundamental tendency existing for the two ends of a divided nerve trunk to unite again is explained by two theories, in favor of each of which experimental evidence is adduced: (1) the degeneration of the severed nerve produces an alteration in the electrical potential existing at the surface of the nerve trunk; from the normal positive it becomes negative, and persists negative during the whole period of degeneration. This difference in potential acts not only as an excitant of cellular regeneration, but determines the direction of growth of the axons; to this current existing between the cerebral and peripheral ends of the divided nerve is given the term "current of regeneration." (2) Marinesco has shown that in regenerating nerves certain ferments appear, one of an organic nature having its origin in the granules of the protoplasm of the sheath of Schwann, and the other of an inorganic (ferrous) nature which plays the part of a catalyzer of peroxidase. It is probable that these ferments are closely related to the growth of the regenerating nerve. From the surgical point of view the best means of ensuring the union of the two ends of a divided nerve is neither by the use of a piece of vein, nor of living nerve tissue, nor even by direct suture of the two extremities, but by the interposition of a fragment of nerve killed and fixed in alcohol or formol.

Maragliano. OBSTETRIC PARALYSIS OF THE ARM. [La Chirurgia degli organi di Movimento, February, 1921.]

Obstetric palsy, according to this observer, rarely can be caused by a lesion of the capsule of the shoulder joint, apart from any muscular or nervous injury. The articular swelling is a symptom of the distortion, and is invariably associated with lesions of the brachial plexus. Muscular defects of the coraco-brachialis biceps, or brachialis anticus, are concerned in the deformity in a certain number of cases. Some degree of improvement in the condition, however long it may have been untreated, can be obtained. Correction or hypercorrection of the deformity, with hyperabduction and external rotation at the shoulder, flexion at the elbow, and

extension of the wrist, hand, and fingers is a primary necessity. Shortly following birth an apparatus which can be removed at frequent intervals for purposes of massage and toilet should be used. As the patient grows older the limb should be continuously immobilized for a year.

Tenani, O. OPERATIONS ON PERIPHERAL NERVES. [Policlinico, March, 1921, Vol. XXVIII, No. 3.]

In this clinical paper five cases of suture and six of neurolysis are analyzed. Tenani obtained the most favorable results in radial nerve injuries. Two years are necessary before the final outcome can be determined.

Klein. POLYNEURITIS FOLLOWING INFLUENZA. [Wien. Arch. f. inn. Med., February 15, 1921.]

In this clinical paper six cases of postinfluenzal polyneuritis which developed six weeks after the acute symptoms had subsided are described. The patients were all women, and three were members of the same family. Spontaneous pain, marked tenderness of the muscles and nerve trunks, disturbance of the reflexes, and flaccid paralysis of symmetrical distribution with partial reaction of degeneration were the chief syndromes noted. Combinations of hyperalgesia of the skin and hypesthesia to touch and temperature with disturbance of stereognosis were also a part of the clinical picture. Three cases showed a combination of polyneuritis with symptoms of encephalitis, and in one of these cases there was possibly a change in the spinal cord in the form of poliomyelitis. Treatment consisted at first in warm applications, diaphoresis, administration of salicylates, and later in faradization, galvanization, and massage. All the cases reacted very well to treatment with one exception, in which the symptoms were probably due to poliomyelitis.

Wittenrood. TREATMENT OF SCIATICA. [Ned. Tijds. v. Geneeskunde, March, 1921, Vol. I, No. 11. J. A. M. A.]

Wittenrood presents arguments to combat the prevailing prejudice against mechanical treatment of sciatica. He discovered the advantages of it in his own person twenty years ago as he cured himself of right sciatica, rebellious for a year to ordinary measures. In pulling off his sock he felt a sharp pain in the right buttock, and surmising that this was from the stretching of the sciatic, he drew up the foot with both hands, trying to touch his forehead with it. The pain was sharp, but after repeating the movement several times in succession the sciatica was cured. The next day conditions were apparently absolutely normal. Years later, another attack of sciatica was cured in the same manner. Since then he has applied it to others, and gives the details of twenty-one cases, and the technic as he has systematized it after research on cadavers. The stretching of the nerve is done by the trochanter being pushed under the nerve by outward rotation of the leg, abduction and flexion, the foot in

the median line and brought up as close to the forehead as possible. The anatomic findings in the cadaver at the different stages of the process are shown in nine illustrations. The sensations of the patient are the guide against too much or too little stretching, and hence anesthesia is best dispensed with. Neuritis is not a contraindication, and success may be realized in the old as well as the recent cases. The course of treatment took from one day to one month in the twenty-one cases tabulated, except four in which from seven weeks to five months were required.

Weil, S. GENESIS OF ARM PARALYSIS IN NEWBORN. [Zentralblatt für Chirurgie, September, 1921, Vol. XLVIII, No. 35.]

These experimental researches, according to the author, support the contention that some of the plexus injuries of the arm that appear to be birth accidents may be, in reality, of intrauterine origin. They may have been produced by cramped positions of the arm in utero.

3. SPINAL CORD.

Egidi, G. TRAUMATIC LESIONS OF SPINAL CORD. [Policlinico, November 14, 1921, XXVIII, No. 46.]

In this clinical discussion of the present status of knowledge concerning the symptoms, course and treatment of trauma of the cord this author states that at the present time no means of early determining whether the injury is from compression or contusion except by estimation of the force of the trauma. If a splinter of bone or the presence of metal, or fracture of a vertebra is evident a chance that correction of this or of a hematoma may release the cord from compression is possible. Special care must be taken by the operating surgeon not to hamper the respiration. Wilms' suggestion to amputate both thighs in incurable paraplegia is discussed. By transplanting the outlet of the urethra to the perineum, the urine would escape stagnation. After an operation for spinal cord injury, the ventral reclining position of Rollier has advantages. Chief among them is the avoidance of bed sores and the healing of the fistula.

Brun, R. CLINICAL SIGNS AND PATHOGENESIS OF LUMBAGO. [Schw. Arch. f. Neur. u. Psych., Vol. VII, No. 1.]

A study of a number of cases in the Nervenpoliklinik at Zurich leads the writer to the conclusion that in chronic and subchronic attacks of lumbago there is usually a perineuritic injury of the posterior branch of the lumbar nerve, more often traumatic though sometimes of toxic-infectious or other origin. In two of the 15 patients examined there was subcutaneous laceration of the muscle. In 10 cases there were found corresponding to the clinical report of a lesion of the rami posteriores of the lumbar and sacral nerves: unilateral atrophy of the M. sacrospinalis with more or less striking lowering of faradic stimulability, in some

cases with partial galvanic reaction of degeneration; objectively demonstrable sensory disturbance in the region of the Nn. clunium sup. All the cases showed symptoms of secondary affection of other sensory areas particularly of that of the N. ischiadicus and of the N. ileo inguinalis (irradiating stimulus within the spinal ganglia). There was frequent neurotic complication which always disclosed itself as a masked sexual hypochondria.

Plaggemeyer, H. W. FRACTURES OF THE SPINE AND KIDNEY AND BLADDER FUNCTION. [Journal of Urology, September, 1921, Vol. VI, No. 3.]

Our final observations after two years and a half, during which period the patients were under complete control as to general hygiene, intake of food and regular clinical surveys, have simply corroborated our original impressions, which might be summarized in epitome as follows: Traumatic fracture of the spine causing acute transverse myelitis has apparently the same bladder syndrome whether the lesion involved the cervical spine or the cauda equina. This syndrome embraces an immediate spasmodic retention followed by a spontaneous paradoxical incontinence of one of three types previously noted by us. There is in all these cases a complete relaxation of internal sphincter, the posterior urethra becoming part of the bladder as in tabes, the verumontanum being plainly seen lying on the floor of the bladder. *Unlike* tabes, syringomyelia, multiple sclerosis, etc., the lesions of which are chronic and longitudinal in type, our type of cases being of the acute transverse variety, show an entirely different pattern of bladder trabeculation. In the cases we have observed, the trabeculations are gigantic, are found on the floor particularly, and have their greatest complexity on the faces surrounding the vertex; whereas in those peripheral bladder lesions of the chronic longitudinal types, involving the posterior columns, the lesions are insular and lace-like and have a tendency to form on the lateral walls rather than on the floor and vertex. This is, however, not a diagnostic point. The musculature in the bladder associated with traumatic cord is hypersensitive to electrical reaction, the cross section of the muscle fiber is considerably increased, and in other words the trabeculation is due to a bulging forward of the muscles into the bladder, whereas in the longitudinal types we have an atrophic musculature, through which the mucosa simply sags outward. Our observations on a number of autopsies have shown that in the acute transverse cord lesions there is no tendency to hydroureter and hydronephrosis. Even in the cases of complete decentralization of the bladder, there is the establishment of automaticity, and for some reason the lower tract compensates for the upper tract, at least during the period of our observations, thus protecting it from hydrostatic back pressure.

The chief danger in all these cases is therefore not a hydronephrosis with increase in pressures, but lymphatic extension and infection from

the bladder. We feel that the rise of blood nitrogen previously observed was due in large part to tissue waste. In the cases in which the nitrogen curve did not descend, we found always renal infection, as a causative factor, but not hydroureter or hydronephrosis.

Sherrington, Ewald and Goltz have all proved experimentally on dogs with decentralized bladders that the ones that were catheterized, inevitably succumbed to infection and contrariwise that in dogs that were not catheterized bladder infection did not supervene.

The practical point is that fracture of the spine with retention of urine will establish automaticity in twenty-four hours if not catheterized. This facilitation of bladder incontinence may be hastened by careful massage over the region of the hypogastric plexus or by the establishment of a peripheral mass reflex through stimulation of the prostatic area in the male by stimulation of the plantar reflex. Such cases should *not* be catheterized. These bladders do not rupture, and can be aided in their establishment of incontinence by gentle abdominal massage. The use of the sinusoidal current has not proven efficacious. [Author's abstract.]

III. SYMBOLIC NEUROLOGY

2. PSYCHOSES.

Hannes. NERVOUS AND MENTAL DISEASE AFTER DIFFICULT CHILD-BIRTH. [Zentralbl. f. Gynäk., July 23, 1921.]

Difficult birth and those accompanied by fetal asphyxia the author contends are not followed by a larger proportion of feeble-minded children than when birth has been normal. He compares a large amount of material which he has arranged in three classes: (1) Those showing marked asphyxia at birth, (2) those whose delivery required artificial assistance, (3) those undergoing spontaneous birth. After deducting cases in which there were present hereditary influences to which etiological importance could be ascribed, the percentage of mentally abnormal children in the three groups were respectively 3.8, 2.4, and 3.4. The author takes definite issue with those who regard injury at birth as an important factor in the production of nervous disease. Their conclusion, he says, have been based on figures derived not from comparative investigations of the after history of children born normally and abnormally respectively, but from an analysis of the history of groups of children receiving treatment in institutions for mentally affected children. Figures of the latter description have been furnished by Klotz, who in 144 such children found 7.6 per cent in whom no other cause could be recognized than abnormal birth; it is not recorded, however, that the birth in these cases, although protracted, occurred otherwise than spontaneously, and subjective histories of "difficult birth" are obtained with ease by means of questions addressed to the mother. Hannes' views have been confirmed by Schott, who, in an analysis of

1100 feeble-minded children, found 150 cases in which there was evidence of probable or possible injury to the head at birth; after deducting cases in which other etiological factors (such as parental alcoholism, tuberculosis, or mental disease) might play a part, 30 cases only, or 2.8 per cent, could be attributed to difficult birth as the sole cause.

Smith, J. C. SOME REMARKS ABOUT HEREDITY OF DEMENTIA PRECOX AND PSYCHOSIS MANIO DEPRESSIVA WITH REFERENCE TO A SPECIAL CASE. [Hospitalstidende, 1921, No. 10.]

The works of the later years regarding heredity of dementia precox and psychosis manio depressiva has given as result that dementia precox—if it is hereditary at all—is transferred in a recessive manner, and that psychosis manio depressiva is dominant in some way or other and perhaps sex limited, in this way explaining the surplus of women suffering from this disease. With reference to these theories the following case seems interesting.

A family consisting of the two parents and four children. The father melancholia, twenty-six years of age. After about half a year's mental depression suicide. The mother after four partus beginning psychosis. Twenty-eight years of age, sent to asylum. Lived there for the rest of her life, the following twenty-eight years. Diagnosis: Typical dementia precox. Dead from bronchopneumonia. All the children insane; two sons, two daughters. Both sons dementia precox, typical cases. The eldest stayed nineteen years in asylum. Dead from pulmonary tuberculosis. The younger stayed ten years in asylum. Came then to a private family, but is not cured. The older of the daughters, suddenly becoming insane, suicided thirteen years old. Diagnosis not possible. The younger of the daughters two times in asylum. Half a year each time. Typical psychosis manio depressiva. Last time in 1906. Since well, working as teacher and natural of mind.

This case (in special that the two brothers suffered from dementia precox) is in accordance with the theories, and not difficult to explain.

Anything about what may be expected when conditions for dementia precox and psychosis manio depressiva meet in one person cannot be said based upon the before said case. [Author's abstract.]

Silk, S. A. THE COMPENSATORY MECHANISM OF DELUSIONS AND HALLUCINATIONS. [Am. Jl. Insanity, LXXVII, 1921, 523.]

The author endeavors to show that delusions and hallucinations are symptoms of disease at the psychological level analogous to such symptoms as chills, fever, and vomiting at the physiological level. Though considered at one time as disease entities, chills and fever have been proven to be mechanisms of defense, which the human body has established during the long fight with its antagonistic environment. Similarly delusions and hallucinations are defense mechanisms established by the individual in overcoming difficulties at the social level.

Two cases are studied: Case I. Soldier, twenty-nine years, single, while in the service of the United States army developed systematized delusions of persecution directed against a certain Major X, under whose command the patient served as a private. This major, according to the patient, has subjected him for a period of over two years to all sorts of hardships and on two occasions prevented him from securing an officer's commission by intimating that he (the patient) was a sadist, a degenerate, and had performed perverse sexual acts. The study of the case shows that the patient was quite homosexual—he was effeminate in speech and manners and since boyhood suffered from a strong feeling of inferiority. Whenever he came into contact with men he was called "Miss Lizzie," "Perfect lady," etc., and it was necessary for him to assert himself and prove his manhood. Intellectually he was above the average and was a man of very good education. His enlisting in the army was in part, at least, a compensatory effort to prove to himself and others that he was a "man." In the army the rougher element made fun of him, which brought the feeling of inferiority more acutely into his consciousness and the climax came when his application for an officer's commission was turned down because the major under whose command the patient served gave it as his opinion that the applicant was temperamentally unfit to govern men, though he was able to pass the examination. His failure to secure a commission caused the patient to feel very much inferior and as a defense against the pain of such a feeling he developed the delusions of persecution against the major, so that instead of admitting to himself that his failure to secure the desired promotion was due to a biologic inferiority of which he was at least partly conscious, he attributes that failure to the antagonism of the major toward himself and thus escapes the pain which the conscious realization of the real reasons for his failure was bound to cause. As a further protection he rationalizes in an apparently successful manner the reasons for the major's antagonism toward himself. Several other delusions which this patient manifested were similarly shown to be defense mechanisms and of value to the patient.

Case II. White male, twenty-seven years, shortly after marriage developed ideas of infidelity against his wife. He left his home, wandered around the country and finally enlisted in the army; there voices called him vile names and the men in his company wanted to kill him, intimating that he had a disreputable character. Following these delusions and hallucinations he was mute, kept to himself, facial expression denoted distress and he took practically no notice of his surroundings. He continued in that state for several years, giving the impression of being markedly deteriorated. Later on, however, he began to improve, while at the same time a strong religious coloring appeared in his speech and actions; he finally declared that he was John the Baptist—he grew a beard, long hair, and his facial expression became Christ-like. He became quite alert, was correctly oriented, spoke in a rational manner, and preached a great deal to those about him.

Analysis of the case showed that this man, when a boy, indulged excessively in onanism, and later on practiced such perverse acts as bestiality; he was, however, heterosexually impotent. Having been brought up in a strongly religious atmosphere, he tried to repress his asocial cravings, and ventured into matrimony—his impotency, however, causes him to feel quite inferior, and he projects his difficulties against his wife by developing against her ideas of infidelity. He runs away from the situation and enlists in the army; there the feeling of inferiority is brought more strongly into his consciousness and he becomes panicky, in which state he remains for several years. Under the protected environment of an institution the stimulus which forced the feeling of inferiority into consciousness wears off and he gradually returns to reality. He must, however, protect himself from the recurrence of conscious inferiority and here his early religious training comes to his rescue. He perceives himself not as an inferior individual lacking in power to “create” but as the messenger of God, a spirit, and hence above all demands of the flesh. He is no more in need of any projection mechanism and hence the delusions of persecution and auditory hallucinations disappear.

The author concludes that just as fever is no symptom of any definite disease so a certain delusion or hallucination is no indication of a definite mental conflict, but just as certain groups of symptoms often indicate a specific disease so a certain group of delusions and hallucinations frequently indicate a definite mental conflict. Delusions of persecution and reference coupled with ideas of great efficiency, powers of invention and history of heterosexual abstinence in a majority of cases indicate homosexuality and impotence. [Author's abstract.]

Van der Chijs, A. ON HALLUCINATIONS AND PSYCHOANALYSIS. [Int. Zeit. f. a. Psychoanalyse, Vol. V, No. 1.]

In his essay on the psychic mechanism of hysteria, Freud shows that hallucinatory delirium originates in elements which have been repressed into the unconscious, delirium being a compensation for unsatisfied wishes and further demonstrates that the symptoms of the paranoid form of dementia are determined wholly in accordance with the scheme of the transformation mechanism of hysteria. Bleuler also found that insane ideas of reference were constructed on the foundation of emotional complexes and Janet states that hallucinations in hysteria and for the most part also in dementia precox consist of fragments or complexes symbolically elaborated in the same manner as in dreams. Since then the opinion has become generally prevalent that the psychic phenomena in these conditions stands in direct causal relation with psychic constitution and experiences of the patient—the psychoses being merely a pathological transformation of normal mental processes. To show that this view may possibly be extended to explain phenomena which are generally looked upon as normal and also to show that psychoanalysis may be advan-

tageously used in pronounced psychoses, the author cites a case from his own experience. The patient was suffering from hallucinations and the author found it difficult to make the differential diagnosis between hysteria and paraphrenia phantastica, but was inclined to regard the disturbance as a true psychosis. Suggestion was used in the treatment and the patient after a time claimed that the hallucinatory disturbances had ceased. He went to London and thence wrote to Chijs requesting that the latter give a description of the method of cure to certain physicians of that city, who were unable to comprehend how it had been brought about. The patient had been admitted to the "Society for Psychical Research" and made his home with the secretary. He was evidently taken very seriously in England. He claimed to be able to produce at will dream pictures of exquisite form and coloring. During the process the patient stated, he was elevated to a state of exalted calm. At times pictures arose unbidden, and this caused Chijs to suspect that the cure was not as thorough as the patient believed. In the same year the author received another letter describing experiments in hypnotism in which hallucinations were simultaneously produced in the patient and in his mother, and, later, a letter calling attention to the work of v. Schrenck-Notzing on the phenomena of materialization. When the patient went a second time to Chijs for treatment it became apparent that he had dissimulated when claiming that the hallucinations had vanished or that he had regarded them as a negligible symptom. Finally, but only with great difficulty, the author was able to convince the patient that the images were autochthonous pathological phenomena and bring to his recognition the erotic factors to which they were due. The case was one of latent megalomania or narcissism. In reporting this case the purpose of the writer is not to call attention to a cure but to show the possibility of gaining better data for the diagnosis, etiology and course of the psychoses. In the psychoses the same laws of development prevail as in the neuroses and the author believes that cures may therefore be brought about by returning through the same avenues to the normal as in the neuroses. It still remains to be demonstrated that the good results thus obtained are lasting. In conclusion the author calls attention to the fact that the patient was an artist and in a digression makes reference to modern painting generally and in particular to a group of artists who are united in Holland under the name of "Das Signal," among others to Laurens van Knik, who feels inspired, he states, "by another world." Chijs is of the opinion that the source of van Knik's inspiration must be regarded as hallucinatory. Copies of two pictures by van Knik are given and the erotic elements therein are set forth. The author finds the reason for artistic expression of this sort in a universal damming back of the libido which seeks sublimation. The war was the most terrible form of outlet for it. Less bloodthirsty expression is found in poetry and music. "Now what does all this mean?" asks Chijs. "The study of history,"

he answers, "might enable us, by comparison, to form notions of the chronological development of these conditions. Such a work would tell us whether we are at present confronted with a normal development of art or by a pathological vitiation." So far as he knows, however, there is no such work in existence but he thinks that much in these new forms must be regarded as the result of normal development—perhaps the greater part of it. In all this we are confronted with profound alterations, if not with contradictions, of what we have hitherto regarded as moral. The ethical moment seems to be displaced, but, in the author's opinion not in a manner out of keeping with the discoveries and teachings of Freud. We are obliged to-day to consider many individuals as falling within the range of "average," whom formerly we would have been obliged to place in the category of ethical or moral defectives. It is also in logical keeping with this natural advance that new delimitations should be made in regard to hallucinations and expressions of art, extending the line of the normal farther in the direction of the pathological. The psychiatry of the future, so far as diagnosis and symptomatology are concerned, will have to be revised and will inevitably be made to bend to the tendency of the times. "The spirit of the age, like the Bolsheviks, with irresistible force sweeps before it the old order of things which have outlived their term. Zeus must be unmanned. We are in the zodiacal sign of Futurism. We are unable anywhere to stand against the new order." [J.]

Robinson, G. Wilse. NEUROPSYCHOSES OF WAR AND PEACE. [Journal of the Missouri Medical Association, December, 1921.]

The author states that all war neuroses disabling military men have their analogy among men and women engaged in peaceful pursuits, and are responsible for much disability among the civilian population. That the disabilities caused by these neuroses among our own troops have not been temporary in character is evidenced by the large number who are alleging residual disability. Neuropsychoses disabled many in service because of their disinclination or inability to adequately meet their difficulties, and the disability continues because of disinclination or inability to meet the difficulties of civil life. The most important physical factor in the development of neuropsychoses is the habit of drawing on the reserve neuropotential and being unable to restore a normal balance and return to the normal condition of automatic renewal of nervous energy as fast as it is used. Physical shock accompanied by horrifying circumstances causing profound emotional shock and terror which is contemplative fear, or fear continually revived in the imagination, has a much more intense and lasting effect on the nervous system than has simple shock. Much of the disability of the exservicemen was during their period of service, and is now, wishfulfilling in character. Many of them reacted with a neuropsychosis and are so reacting now, in order to escape the painful realities and avoid the difficulties of military and civil life.

Fear is a very important factor in the development of a neuropsychosis, and the duration of the fear reaction is much more important than the initial intensity. If there is not a quick recovery from the initial fear a superfatigue ensues and results in disabling symptoms. Many exservice men have mythomania which helps to keep alive the neuropsychosis. In order to keep the interest of the public and get the sympathy of their associates, and be honored as heroes, they greatly exaggerate their experiences, and in the frequent relating of them they increase in magnitude, and the relator himself comes to believe them to be true. This is also true of many civilians who have been injured, or have had unhappy experiences. By the name of *sinistroses* Brissaud describes a neuropsychopathic condition which promotes the development of a neuropsychosis among soldiers and civilians. This condition is very prevalent among exservice men who for any cause have become disabled, or among workmen who have been injured while employed. Such individuals feel that they will not be as efficient as they were before they were injured. Their minds become concentrated on the injured part, much pain is experienced with no physical foundation, the soldier begins to worry about his compensation to which he believes himself entitled, the civilian about his claim for damages. They are called *sinisters* and wherever found are disturbing factors, stirring up much dissatisfaction in hospitals among Legionaries, Red Cross workers, etc.

In treating neuropsychoses, or war neuroses, it is necessary to recognize that the individual patient may, and usually does have, either by inheritance or acquisition, some physical basis as one of the fundamental causes of the nervous disorder. Careful physical examination should be made to determine what physical defects may be present, and it requires some judgment on the part of the physician to correctly decide whether such defects found are contributing factors of the neuropsychosis.

The majority of those developing a neuropsychosis are lacking in resiliency. There are lead men and rubber ball men. Lead dropped in a hole does not bounce out, but the rubber ball has a chance; many men can bounce out of any kind of a hole while others have no bouncing qualities at all.

Exservice men developing residual disability because of neuropsychosis should be hospitalized in special hospitals or training camps, where they can be reëducated or retrained under military discipline, so that they may successfully reënter civil life, otherwise there is no hope of recovery for the majority of them. [Author's abstract.]

Henderson, D. K. WAR PSYCHOSES — THE INFECTIVE-EXHAUSTIVE GROUP. [Glasgow Medical Journal, December, 1921.]

In this article, illustrated by case records, attention is particularly drawn to the fact that the term "confusion" has tended to be used in a very loose sense. It is true that confusion is a frequent occurrence in many varieties of mental disorder, both organic and functional, but it

never should be designated as an entity in the form of confusional insanity, because confusion is a symptom with a definite meaning. It is only right to use the term in a descriptive sense, where the patient is completely disoriented in all fields. It has seemed to the writer that such cases could be much more accurately and better grouped along with the infective-exhaustive psychoses.

The present report is based on a series of 115 cases. These cases tended to show a number of special forms which seemed to depend on the patient's personality. There was no specific type of reaction, that is to say, there was no one type of psychosis peculiar to malaria, another to typhoid, another to sunstroke, and so on, but all of these factors tended to produce a type of psychoses which was characterized by the same group of symptoms.

The most striking and the most frequent groups were those which showed a delirious type of reaction, but other groups consisted of an irritable, suspicious, deluded state, a state characterized by depressive hallucinosis, a dull, apathetic, depressed group, stupor, mania, and Korsakow's syndrome.

Although these groups could be designated, as Hoch suggested, into organic, affective, and trend reactions, the feeling has been that it would be better to keep them rather apart from such an arbitrary distinction, owing to the fact that each or any of these types of reaction may be present in practically every kind of case; a delirium, for instance, shows almost entirely organic features, but at the same time affective and trend reactions do occur in delirium.

In conclusion, the lack of facilities for dealing with this type of case outside of a mental hospital is emphasized. There would seem to be no reason why such cases should not be satisfactorily nursed in a general hospital rather than in a special type of hospital. [Author's abstract.]

Hulst. DOUBLE MURDER AND SUICIDE. [Ned. Tijds. v. Genes., November 26, 1921, Vol. II, No. 22.]

A case of murder plus suicide is described in which necropsy revealed unsuspected parietic dementia, explaining the apparently motiveless tragedy.

Looft. CEREBRAL RACHITIS AND THE MIND. [Acta Ped., December 15, 1921, Vol. I, No. 3. J. A. M. A.]

Looft applied four tests to 72 normal children and to 134 rachitic children to estimate their mental capacity. He found that the rachitic infants and older children were almost always comparatively backward in the evolution of their intelligence. This backward development was most evident in children one or two years old. Effectual treatment of the rachitis has a remarkable effect in hastening mental development. A deficit in calcium and in phosphorus is probably responsible for this relative backward development. Even after clinical recovery from the rachitis, the children are not always quite as bright as others of their age.

Schuster, J. CONTRIBUTION TO THE KNOWLEDGE OF ALZHEIMER'S DISEASE. [Gyógyászat, 1919, Vol. V, No. 11.]

The author, taking as a basis the histological investigation of three cases of Alzheimer's disease in comparison with thirty cases of senile dementia and brains of normal aged people, considers the fibrillary changes in Alzheimer's disease to be due to an *heredodegenerative* etiology. This means that the fibrillary changes arise out of the inherent weakness of the fibrils, acted upon by the Tay-Sachs amaurotic idiocy. The so-called hyaloplasm of the primary neuron, the fibrils play no part in the heredodegenerative diseases, idiocies, but only in the diseases which develop at a later age as in presenile dementia, a psychosis which comes to development already in the forty to fifty years, and also in the hereditary diseases of the nervous system which Jendrassik has described clinically. The disturbances of the fermentative metabolism, which set in early, also play a part in the disintegration and changes of the neurofibrils. These changes are thus specific. Early aging and all the phenomena of involution of the organism are also explained thus. Investigation of the glands with the internal secretion showed the prevailing atrophy of the thyroid gland. The thickening, bending, twisting formations of the neurofibrils in Alzheimer's disease are not senile changes of the fibrillary structure but are the result of a constitutional weakness of the fibrils themselves, together with the result of the thyroid gland dysfunction, which we always find in presenile dementia. The true senile alterations of the brain cortex and of the cord are added then to these changes which have a heredodegenerative foundation and cause. I might add further the result of Schaffer's work. Schaffer found in the investigation of a case of spastic paralysis that fibrillary changes are to be seen in the third and fourth layers of the central convolutions and only there, as in Alzheimer's disease. Here most of the fibrils and cells are affected by a predisposition to the disease and prove a recognized heredodegenerative disease. Experimental works of the year 1921 showed that extirpation of the thyroid causes fibrillary changes as in Alzheimer's disease. Alzheimer's disease forms a member in the series of heredodegenerative diseases since it arises out of a diffuse heredodegenerative change in the fibrils of the central nervous system. [B.]

BOOK REVIEWS

Vorberg, G. ZUSAMMENBRUCH (I) NIKOLAUS LENAUE, FRIEDRICH NIETZSCHE, GUY DE MAUPASSANT, HUGO WOLF. (II) HEINRICH LEUTHOLD, ALFRED RETHEL, VINCENT VAN GOGH. [Otto Gmelin, Verlag, Munich.]

Ever since Ibsen wrote his "Ghosts" the intelligent layman has been able to appreciate the tragedy of general paresis. When it strikes men of genius or of conspicuous ability its importance for ethical evolution slowly is engraved into human experience and ultimately will be of inhibiting importance in such advance.

In these two volumes short pathogenic sketches are offered of the lives of Lenau, Nietzsche, Maupassant, Wolf, Leuthold, Rethel and Gogh, whose useful careers were all cut short by this disease.

It seemed that the human race was to have been spared for a time the ravages of syphilis but with the mass psychosis of the recent war syphilitic infections augmented to almost colossal proportions. The aftermath of feminist freedom striving has tended to add its weight to the temporary regression of female chastity ideals and many of the so-called upper classes are reaping a grim harvest in their youth as a result of their "phantasy freedom" activities.

The human protest to "fiat" efforts to compel uniform rules of conduct contributes to the motives just sketched and the pessimist sees troubled water ahead for society's welfare. It is well that our attention should be called to one factor in human evolution and the reviewer recommends these two excellent volumes to the student of psychiatry and sociology.

Robertson, John W. EDGAR A. POE, A PSYCHOPATHIC STUDY. [G. P. Putnam's Sons, New York, London, 1923.]

Robertson's book is one that has come to fill a long existent need. The world, as the author points out, was too ready to accept a defamatory estimate of Poe. On what basis such a representation of his life may have rested one may examine with great interest in the space which Robertson gives to it. He has given his own critical opinion of the misjudgments made of Poe the man and has also appended the documents to which his criticism is directed. Still more important, he has tried faithfully to set forth Poe's personality in the light of his inheritance, the diseased state of his brain, due to its constitutional background with the effect upon it of the events of his life, of which also it was so largely the cause. He has shown the place within this picture of Poe's brilliant literary production and its decay. He has shown the weakness but also the glowing beauty of the character of Poe the man. Robertson has not upheld a preconceived ideal which he seeks by any means to justify. A student

and admirer of Poe's works, he has exercised, however, the fairness of the scientist assembling a background of facts that the man and his works may be known as they are. Two criticisms of the book urge themselves. The author has so much rich material which he presents in such interesting form that we feel he should have arranged it with more conciseness and with less discursiveness, particularly in regard to somewhat irrelevant quotations. It is chiefly in the first part of the book that one finds these defects. The other complaint we might make is the too close adherence to an explanation of Poe's mentality in terms of materialistic brain diagnosis. That "newer psychology" of which Robertson speaks so slightly awaits an application to Poe's life which should yield still richer results in sympathetic appreciation of its difficulties and its brilliant manifestations of genius.

Kirchoff, Theodor. DEUTSCHER IRRENAERZTE. Ester Band. Mit. 44 Bildnisse. [Julius Springer, Berlin.]

To those who float on the surface of life's stream the Present is all-important. Such are the practical, the imminent. They live in the Now and know whereof they speak. Oblivious to what they have inherited from the Past, they are too prone to forget the sources of their being and treat with small interest any reminder of this obligation. It is too often a thankless task for the historian to bring them back to the sources of their inspiration, and the foundations of their elaborations.

The past hundred years has seen in psychiatry a steady forward evolution, and in this most interesting volume one may learn much of what Germany has contributed to this march of progress which culminated in the descriptive psychiatry of Kraepelin and the dynamic psychiatry of Bleuler.

Kirchoff first sketches the life histories of some of the forerunners of German psychiatry, including such as Paracelsus, Weyer, Plater, Stahl, Unzer, Greding, Weikard, Frank, and Gall. Then follow a series of short biographies of German psychiatrists of the eighteenth and nineteenth centuries by a number of well known present day students of mental problems. There are about 50 of these with 44 portraits. Among them we may mention Reil, Heinroth, J. Horn, Jacobi, Nasse, Jessen, Ideler, Friedreich, Damerow, Flemming, Roller, Zeller, Feuchtersleben, Spurzheim, Stahl, Lessing and Snell. These biographies have been written by Kraepelin, Vocke, Berze, Specht, Gaupp, Neuberger, Laehr, Obersteiner, Mönkmöller, Rieger, Birnbaum and other well known figures in present day German psychiatry.

We hope for a second volume soon to continue this noteworthy contribution to the history of psychiatry. [Jelliffe.]

Bouché, G. et Hustin, A. CHOCS THÉRAPEUTIQUES CONTRE CHOCS MORBIDES. [Masson et Cie.]

The authors here report upon researches made during the past seven years upon various problems connected with the general conception of anaphylaxis. They first try to outline the general

phenomena; call attention to noteworthy differences in the reactivity of man and lower animals, and then generalize as to the anaphylactic syndrome, where they state (1) the mechanism of the phenomena of shock is made up of two phases—one vascular, the other trophic. Hence they derive the name Vasotrophic, (2) The results of local anaphylactic reactions, (3) the absence of the Aathus phenomenon in man under observed conditions which makes it possible to employ anaphylactic shock reactions over long periods in man.

To the neurologist the chapters on the use of the anaphylactic shock reaction in epileptics and in migraine are of interest and may be read with profit. The evidence submitted as to the therapeutic value in these syndromes is of the very flimsiest nature. If used as an incentive for studying in greater detail these complicated biological reactions well and good, but on the basis of the material analyzed the conclusions drawn show a lamentable lack of knowledge of the enormous complexities that lie behind both the epileptic and migrainous attacks.

Solomon, Harry C.; Solomon, Maida Herman. *SYPHILIS OF THE INNOCENT. A STUDY OF THE SOCIAL EFFECTS OF SYPHILIS ON THE FAMILY AND THE COMMUNITY.* With 152 Illustrative Cases. Made under a Grant from the United States Interdepartmental Social Hygiene Board. [Washington, United States Interdepartmental Social Hygiene Board, 1922.]

The form into which this book is put is exactly suited to the service it has to perform. It is concise, brief, but its matter is presented with an authoritative directness which represents the author's ability to present the subject of syphilis to the public. It contains a good deal of practical information which cannot fail to be of service to the general medical man who must be at least on the watch for syphilis and particularly in this less suspected field, among the "innocent." It handles the subject in a very practically enlightening manner for the social worker and is a book that should certainly be read by the general public. It should help to bring that knowledge of syphilis which is the best measure for its control. At the same time it presents that knowledge in such a way that action should be roused in the most sane and effective manner.

Parsons, A. C., Macnalty, A. S., and Perdrau, J. R. *REPORT ON ENCEPHALITIS LETHARGICA.* [His Majesty's Stationery Office, London, 10s., 1922.]

This valuable summary of a study of the English epidemic of encephalitis of 1919, 1920, is issued as a Public Health document. It is an "account of further inquiries into the epidemiological and clinical features of the disease; including an analysis of over 1250 reports on cases notified in England and Wales during 1919 and 1920" together with a comprehensive bibliography.

It is one of the most comprehensive and detailed of the various monographs upon this singular syndrome and offers a complete survey of the various possibilities. There are 1243 bibliographical references.

Bayle, Centenaire de. LA PARALYSIE GENERALE. Henri Colin, et al. [Masson et Cie., Paris.]

On May 30, 31, 1922, there was held by the Medicopsychological Society of Paris, a hundred year anniversary, commemorative of the publication of Bayle's Thesis on General Paresis. These two volumes present the proceedings of this interesting occasion.

Henri Colin presents a short introduction; Bayle's Thesis is reprinted; Laignel-Lavastine contributes a masterly study on the precursors of Bayle. Semelaigne follows with a historical sketch of Bayle and his work at the Charenton. Arnaud then takes up Bayle's later work and the Salpetriere developments. This makes up Vol. I. Vol. II gives a résumé of the meetings, a discussion of the chief reports, a number of minor communications, etc.

An interesting and valuable historical document.

Maranon, G. PROBLEMAS ACTUALES DE LA DOCTRINA DE LAS SECRETIONES INTERNAS. [Ruiz, Hermanos, Editores, Madrid.]

Tons of literature with their thousand differing opinions concerning this recent claimant for the king's throne block the highways and bypaths of medicine and the physician stands bewildered, hoping for some superprophet to lead him safely through the maze.

Marañón, physician to the General Hospital at Madrid, and known for many years as a serious and competent investigator and teacher, in this small monograph makes a noteworthy attempt to give the chief present-day outlines of endocrinology. After a short introduction, he talks of the Actual Concept and Terminology. This is followed by five chapters on Physiological Significance of the Internal Secretions; then three on Clinical Endocrinology, and a final chapter on Biological Limits of Opothrapy.

The author has given us an excellent review of the situation, chiefly, however, from the older humoral standpoint in medicine. The conception of the organism as a whole with its necessary emphasis upon the psychological aspects of human behavior as of primary importance is practically left out of consideration. The endocrines are here considered more as masters, rather than as servants of the nervous system in its integrating capacity for social ends. This larger viewpoint is not sufficiently stressed in this otherwise most acceptable contribution.

Vogel, Karl. ALOHA AROUND THE WORLD. [G. P. Putnam's Sons, New York.]

This volume relates the incidental features of a trip around the world by a physician who had been chosen to be the friend, the comforter, and the protector of the owner of the vessel and his servants.

It is of interest to our readers only as a simple record of what happened. We note it here solely because the author is much esteemed by us, and, in our opinion, his contribution is worthy of permanent record in the printed page.

Bainbridge, William Seaman. LE PROBLÈME DU CANCER.
[O. Doin, Paris.]

In the medical field, under certain stresses, figures of prominence stand out on the basis of merit, of chance, of numerous factors which are analyzed with difficulty. Be they what they may, Dr. Bainbridge, by reason of really meritorious service in the World War, has been recognized as a leading figure in the surgical world and his interesting volume on the "Cancer Problem" has been chosen as one to be translated into French and made the occasion of a personal tribute to his services to suffering humanity.

We congratulate Dr. Bainbridge on the honor conferred upon him and are inclined to fall into theological phrases—"well done, good and faithful servant," knowing his ecclesiastical forbears, and being personally a believer in his integrity, his ideals, and his desire to be of service to his fellow men. Properly speaking this review has no application to neurological problems. It is purely a personal tribute to a personality much esteemed, and worthy, in a covetous world, of a word of commendation.

Wilbrand, H. u. Saenger, A. DIE NEUROLOGIE DES AUGES. Achter Band. DIE BEWEGUNGSSTÖRUNGEN DER AUGENMUSKELN.
[J. F. Bergmann, Wiesbaden, 1921.]

The eighth volume of this monumental series of monographs, within one of completing the series, concerns itself with the motor disturbances of the eye muscles—external. A short discussion of the anatomical features of the eye muscle nuclei, pathways, etc., opens this volume. From an anatomical point of view it leaves much to be desired. Thus Brouwer's very careful comparative studies on the Oculomotorius are not included, although available. There are only 8 pages, and this is not sufficient even to outline the situation.

The clinical material, however, and its mode of treatment, atones for the anatomical insufficiencies. Every variety of anomaly in eye movement is fully discussed in the following pages. Detailed comment is superfluous. In no other place can one find so full and detailed a consideration of the eye movement variations, the palsies, from peripheral, nuclear, or cortical involvement, and the various complicated and interrelated activities of the third, fourth and sixth nerve functions are extensively outlined. Two-thirds of this 500 page monograph is devoted to the study of nystagmus. At least 2000 studies are analyzed and, as is well known, the authors have conscientiously digested the findings. Volume 8 is an indispensable one in this masterly collection of studies.

Harvard Medical School. DEPARTMENT OF NEUROLOGY. Vol. VI.
[Boston, 1922.]

It is a pleasure to note that the publication of the volumes of collected studies from the neurological department of Harvard Medical School have been resumed after being interrupted in 1912. Dr. H. Viets is the editor.

OBITUARY

STEPHAN VON APATHY

Stephan von Apáthy was born in 1863 in Budapest. He finished his studies in the intermediate and the high school in Budapest and became doctor of medicine there in 1885. He served for a brief period in the pathological-anatomical institute and then as assistant in zoölogy. In 1886-1889 he worked abroad, chiefly at the zoölogical station at Naples. In 1888 he qualified in the Budapest university for histology. In 1890 he received the professorship in zoölogy in the university at Kolozsvár where he remained until his death.

He departed this life September 27, 1922, after a long and severe illness. He was not only one of the best exponents of culture and one of the most prominent scholars of his native land, Hungary, but also one of those students of nature who have left behind them a name of lasting value in the international world of learning. His name is known everywhere chiefly through his works upon the neurofibrils. The first histologists who had examined nervous tissue, Remack, Haeckel, Leydig, had already observed that the axis fibers show a fibrillary structure. In the 50's of the previous century countless observations bore testimony to the fact that the nerve cells likewise contain fibrils. This was first announced in full by Max Schulze and confirmed by Ranvier. The state of microtechnic at that time, neither Kupffer's acid fuchsin stain nor Ranvier's gold process, was such that the fibrillary structure was plainly visible, so that the existence of the neurofibrils for the greater number of histologists remained undetermined. This happened so much the more easily since just at this time, at the beginning of the 70's, Golgi's method offered a means really favorable to the investigation of the nervous tissue and a definite basis for the neuron theory advanced at that time by His, Forel, Cajal and Waldeyer. The neuron theory needed no finer elementary structure like the fibrils for its theoretical establishment. All that was necessary to it were the cell bodies impregnated completely with chrome silver, cell processes and nerve endings. The question arose, it is true, of the association and connection of the nerve cells with one another or with the end organs. This question received so great an illumination

through the rich studies with the Golgi method and so convincing an explanation through the neuron theory based upon the latter that the conception of the structure of the nervous system as well as of its development and function was governed by the leading principles of this theory.

At this epoch, at the time of the first victorious advance of Golgi's method and of the neuron theory, appeared the foundation-laying work of Apáthy upon the neurofibrils, 1889-1897. He succeeded



S. APATHY

for the first time with his process after impregnation with gold in representing with all distinctness the neurofibrils in the cells in the nerve tracts and end organs of the invertebrates. He had observed a network of fibrils everywhere connected which now, united in stronger bundles, passed through the axis cylinders, now divided into elementary fibrils in the nerve cells about the nucleus or in the end organs to unite in a lattice work between the cells. He asserted on this ground that the nerve conduction takes place in a closed circuit like the circulation of the blood (theory of continuity), that this

path peripherally as well as centrally consists of a connected lattice work and that the actual conducting elements of the nervous system are the neurofibrils and only the neurofibrils. This theory naturally meant a declaration of war upon the neuron theory, especially since Apáthy, going still further, ascribed to the nerve fibers an origin independent of the nerves and a development from the chain-like mesoblast cells. It is therefore easy to understand that his discoveries and theoretical discussions immediately after their publication became the object of general debate which occupied the best neurologists and neurohistologists for almost thirty years. This conflict over the neuron theory, which belongs to the most impressive scientific controversies of the century and to the best achievements of finer histology, placed many in opposition to the theory of Apáthy (Cajal, Waldeyer, von Lenhossek, Held, etc.). On the other hand, it thoroughly convinced certain ones like Bethe, Lugaro and Boecke. If to-day, after the elucidation of many debatable points and after the dying down of the scientific battle which has now become historical, one weighs the results objectively one cannot deny that the neuron theory as such not only has affirmed its position but has been strengthened essentially by more recent investigations as, for example, those of Harrison, in regard to the development of the axis cylinders in tissue cultures. On the other hand, knowledge of the neurofibrils has become a general possession of histology and the morphologic character of these organs which found its classic expression in Apáthy's communications was finally taken over also by specialists who did not follow Apáthy's theoretical discussions or had even disputed them.

Apáthy himself contributed little to the further development of the discussion after the appearance of his chief work in 1897. He further supported his theoretical discussions neither through a broader histologic and embryologic material extending itself also to the vertebrates nor through experimental work. Only in 1907 he appeared with a controversial publication against the results of Cajal in regard to the finer constitution of the nervous system. But his brilliant dialectic could not compensate for the absence of material on the vertebrates in which in fact the works of Cajal were so rich. His chief strength still lay in the unexampled clearness of his histologic preparations, his keen logical thinking and his masterly control of all microtechnical problems. It was no easy task for his opponents to present microscopic proofs which could stand in the microtechnical sense before Apáthy's keen criticism. He was also

the master to whom there came a large number of histologists to Naples, where he worked every year at the zoölogical station and his institute in Kolozsvár, as pupils to acquire his method of gold impregnation.

Apáthy is best known in the broad scientific world as a neuro-histologist yet his importance as a microtechnician is surely greater. His accuracy, his aptitude for clear, careful work, his order and logical treatment made him most fitted to introduce logic and science into microtechnical methods. There is scarcely a field of microtechnic in which he has not done active work. Aside from numerous improvements of great importance in the technic of cutting, staining, and fixing, his best achievements are in the field of celloidin imbedding, of which he was master. He gave the correct basis to celloidin imbedding and worked over the technic of oil-celloidin and double imbedding. A less known and yet valuable procedure is his imbedding with oil-gelatin. He has set forth in part his comprehensive microtechnical knowledge in his "*Microtechnik der tierischen Morphologie*," Vols. 1 and 2. Unfortunately this work, which was planned as the only existing critical and historical consideration of the microtechnical procedure, remained unfinished. Likewise his chief zoölogical work, the monograph on "*Hirudo*," did not reach a conclusion. Apáthy was one of the best informed authorities upon worms and as a zoölogist he occupied himself from his student days almost exclusively with the morphology and classification of the leeches. His large collection with a large number of artistic drawings, like so many other works of culture, were sacrificed to the war and the post-war period.

The man who won fame as neurologist-microtechnician and zoölogist in his personality was a man of great stimulus and of a high idealism. His mind responded with understanding to everything in the world which was great and beautiful. Yet before everything else he was a Hungarian through and through, loving his fatherland with every impulse of his soul. He had to pass through the experience of having his fatherland rent asunder by the peace of Trianon and his institute at Kolozsvár, which perhaps was the most beautiful biological institution on the continent, given over to the possession of Rumania. He did not long survive this. Although very ill he followed his university as it was driven from Kolozsvár to Szeged where, still clinging to the hope of a better future, he died of heart disease.

PROF. DR. TIBOR PÉTERFI.

MORITZ PROBST

Dr. Moritz Probst died in March, 1923, closing a life of unexampld activity. He was born in 1867 in Styria, son of a revenue officer in this part of Germany. He was educated in Graz both in his gymnasium work and in medicine and he also served there as assistant in the neurologic-psychiatric clinic of Professor Anton. He passed from six years of such service to the position of second physician in the former insane asylum of Graz in which position he remained until 1905. This was the period of his active scientific work. He carried on extensive investigations and experimental studies in brain anatomy and brain pathology, working with great zeal and endurance although in cramped quarters, in the laboratory of the old institution. He published extensively the results of his labors in the "Archiv für Psychiatrie," "Archiv für Anatomie," "Deutsche Zeitschrift für Nervenheilkunde" and the "Jahrbuch für Psychiatrie und Neurologie." His work received wide recognition from leaders in brain pathology. Lewandowsky gave the name of Probst's commissure of the lateral lemniscus to the tract which Probst had recognized as the central auditory tract and the tractus Probsti to the fiber tract running adjacent to the root fibers of the trigeminus, which had been described by Probst. His works reached the number of forty-six, some of them attaining the size of complete volumes.

In 1900 he became legal psychiatrist in the penal affairs of the state court, succeeding in 1905 to the position vacated by Dr. Hinterstoisser as official physician in civil affairs in the state insane asylum. Here again he made known his work through publication of a contribution to the work of Dietrich and Anton, "Handbuch der ärztlichen Sachverständigentätigkeit" upon the causes of mental disease and their valuation from the legal standpoint. As official physician for the institution he carried out his duties in forensic psychiatry with the same energy that had characterized his scientific work. His position entailed endless clerical work which he performed with his own hand with great rapidity. But his strenuous activity contributed to the undermining of his health and he died from the results of premature disease of the cerebral vessels. His death is felt by a large circle of colleagues in his own profession and members of the legal profession beside his own family and personal friends, for although of a retiring nature his activities had made him known and appreciated by many.

NOTES AND NEWS

Professor Juliano Moreira was the guest of honor at a special meeting of the Brazilian Sociedade de Neurologia, etc., on the completion of his twentieth year as director of the psychiatric clinic at Rio de Janeiro. He was also tendered a banquet.

PSYCHIATRIC CLINIC ON FULL-TIME BASIS

Sufficient funds to place the Henry Phipps Psychiatric Clinic on a full-time basis are practically in hand, as all but \$35,000 of a fund of \$2,000,000 has been raised. This, it is confidently expected, will be raised before the end of the month, the time limit set by the anonymous donor who contributed \$1,000,000 on condition that it be equaled within a specified time. In addition to the initial gift of \$1,000,000, the Rockefeller General Education Board has contributed \$750,000, and Mr. E. W. Harkness of the Standard Oil Company, \$125,000. Other contributions have amounted to \$90,000. With the exception of the psychiatric department in the University of Iowa, this will be the only department of psychiatry in a medical school on a full-time basis.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

The Journal OF Nervous and Mental Disease

An American Journal of Neuropsychiatry, Founded in 1874

ORIGINAL ARTICLES

SOCIAL WORK WITH TRAUMATIC NEUROSES

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This brief survey was undertaken in the hope that such a piece of work might suggest a better method of treatment for traumatic neuroses. Thirteen cases that have already received special treatment are reported.

For the sake of definition let us quote Jarrett,(9) who says: "Social work in the broadest sense is conceived as the art of preventing, alleviating, and curing social disorders; of adjusting every form of social disorder; of promoting right social relations."

Social disorder is any maladjustment between human beings, or between them and the institutions of civilization. Lack of adjustment may be in the family, school, church, industry, or government, and result in depriving human beings of what they may consider inherent rights—an active and contented mind in a vigorous body, capable of struggling, achieving, and procreating. The cause of the difficulty may arise within the individual because of bad habits, too strong or uncontrolled instincts, or emotional complexities; it may lie in the institutions to which he is unadjusted. Innumerable technical experts are required to find and name the causes. It is the business of social work to effect adjustments. There are three main forms of social work, that with the individual, with the community, and with the state. All three will be considered in this paper.

Neuropsychiatrists differ widely in their attitude toward "traumatic neurosis," and their use of terms is variable. In general it is accepted that neurosis is a functional as opposed to an organic disease of the nervous system; this McDougall(10) exemplifies by the behavior of a gasoline motor which is either so hot or so cold that it will not run. Its structure is unimpaired but it will not function until environmental conditions are changed. Rosanoff (15) further explains that "environmental factors determine the manifestation, though the disorder cannot arise in the absence of the constitutional factor, but remains latent until some external cause brings it to light."

In regard to traumatic neurosis Bailey(3) says: "Traumatic in its most restricted sense applies only to such injuries as are the result of acutely acting violence, while in its widest sense it includes any detriment to health which originates outside the body. It is better for clinical purposes to use traumatic as indicating quickly acting physical violence or psychic shock which originates outside the body." Osnato(14) shows how "traumatic neurosis is induced by fear, chiefly the fear of falling," and cites cases in which the patient refuses to return to any kind of work which suggests the possibility of repetition of the accident. From a more purely psychological standpoint it may be explained that "through personal injuries we learn to fear a person or thing * * * We then experience the emotional excitement and impulse appropriate to the movements of flight without recalling the occasion of the former injury suffered, and by association many things may suggest the emotional terror surrounding the accident and add to the mental condition responsible for the symptoms."(14)

"If the patient resists this impulse to flee there is no physical means of expending the energy instantly mobilized with the feeling of fear. This causes exhaustion without actual expenditure of muscular energy."(4) As Osnato(14) points out, this would seem to be a good explanation of the hyperactive condition of these patients. He differentiates traumatic neuroses from what he calls traumatic hysteria, or, as Dercum(7) calls it, "Litigation Hysteria." The latter says that there are three unassigned causes—trauma, fright, and the prospect of compensation, and he describes the extraordinary phenomena sometimes presented by the hysteria of litigation in courts as due in part to autosuggestion of the plaintiff, in part to suggestions of friends, relatives and lawyers, but in greatest part as due to suggestions presented by many, the frequently repeated, and often endless medical examinations.

Two other points of view on this problem are Timme's(18) studies of patients who show defective action of the endocrine glands controlling the vegetative nervous system and Adler's(1) organic inferiority concept. Both these authors consider malingering as well as neurosis as possibly arising on an organic basis. Fisher(8) also classes malingerers as abnormal, and goes on to show what an important part the state plays for good or evil in these cases: the delays in hearing cases, indiscriminate benefits for trivial injuries, allowing politics to interfere with business, lack of trained medical commissioners, and freedom from prosecution.

The consensus of medical opinion socially expressed is that neurosis, including malingering, represents various expressions of personalities which have failed to adjust themselves to the particular situation. These patients do not understand their own trouble, and they lack intelligence, energy and resourcefulness either to adjust, or to place themselves in a new environment. So they take refuge in a neuroses as an ostrich is said to bury his head in the sand, thinking he is out of the difficulty. They may be brought out of this state by skillful therapy and with time and patience may be taught to adjust themselves in the same situation, or in another deliberately chosen because it is somewhat more favorable to the individual. As Bailey(3) says: "The successful physician treats the patient rather than the disease."

The history of this subject is interesting from a medical, legal, and social standpoint, and may be roughly divided into three periods in which the best constructive thought has been successively directed from these three different points of view. From 1866 to 1911 the only critical attention given to these cases, their legal status, their treatment or prevention, was by neurologists.

The first paper of real interest on the subject was a treatise published by *Erickson on Railway and other Injuries of the Nervous System* in London, 1866. Eighteen years later, in 1884, Dana made a review of studies up to that time, but not until 1889 was the term "traumatic neurosis" used by Oppenheim. Three years after that it was generally recognized as a functional condition. The disorder was first explained as a disturbance of the circulation of the spinal cord, and later as multiple areas of inflammation disseminated throughout the whole cerebrospinal system. It has successively been regarded as altogether functional, or altogether feigned, but it now seems that these functional traumatic neuroses can be properly classified even though they may not be perfectly understood.(3)

The first constructive legislation in the United States was the Federal Compensation Law passed in 1911; this was followed by various states in rapid succession. Only three states are now without a modern compensation law. Nearly all the states have established either Industrial Accident Boards or Compensation Commissions which handle all doubtful cases without bringing them into court, although the law usually permits court action if the patient so desires.

Recognition of the great legal problem involved was very slow in coming, but once it arrived was quickly translated into law. Smith (16) says: "When the great industrial expansion began about 1880, the whole accent of business was upon speeding up output and not upon safety. Employment in many industries became more hazardous than military service in time of war." In the twenty-one years preceding 1896 the number of personal injury suits settled in court in Cook County, Illinois, rose from 200 to 893, and those were only about 10 or 12 per cent of the claims entered. To again quote Smith (16): "Thousands of injured workmen faced long and difficult litigation calling for the expenditure of much money for lawyers' fees and expenses. Many of the largest and best offices gave up general practice and engaged exclusively in business and corporation law. . . . There was no place to which the injured workman could turn for redress. Legal Aid Societies declined to accept any personal injury cases. . . . To fill the gap came the contingent fee depending upon the success of the litigation. . . . Because the stakes were high and the players essentially gamblers, it induced the unholy triumvirate of lawyer, runner, and doctor conspiring together to win fraudulent cases. It has degraded expert testimony and served as a cloak for robbery through extortionate fees."

The Federal Workman's Compensation Law (2) was passed in 1911. The principle involves, in the main, the following points: (1) payment for injury irrespective of fault or negligence except where caused by wilful misconduct or other aggravation of responsibility; (2) the benefit payable bears definite relation to the former earning capacity subject to minimum and maximum and not intended to give full indemnity; (3) payment of benefit in periodic installments subject to commutation to a lump sum under specified conditions; (4) denial of compensation for a brief initial period to eliminate the great mass of insignificant injuries, but provision for their medical treatment; (5) encouragement of arbitration; (6) abrogation of the right of action at common law, except where fault of employer is abrogated. In cases of total disability, most states

reduce the amount of compensation and the period of payment in proportion to the injury. Massachusetts has a definite schedule for partial disabilities. Payment begins seven to fourteen days after the injury. Savings or any form of mutual benefit which may be due are not to be considered. The Report of the Massachusetts Industrial Accident Board (12) says: "Prior to the passage of this act, a workman injured in industry in a large percentage of cases found himself without any legal claim for loss of wages, doctors' bills, and his own suffering."

The main principle is determined by the legislature and the application of the principle is to be carried out by a board or commission instead of through court action. The Massachusetts Board of Boilers' Rules in 1907 was the leader in this principle of administrative decision. The Wisconsin Industrial Commission followed the Compensation Act in 1911, and the Massachusetts Industrial Accident Board was established in 1913. The American Year Book reports forty-five states as having compensation laws in 1919.

The result of all this legislation has an important bearing upon both medical and social aspects of traumatic neuroses. The expense with its leprous comrade, the contingent fee, and the possibility of malingering for high stakes, are eliminated; the delay, the anxiety, the repeated examinations and the attitude of conflict, all aggravating the medical symptoms, are reduced, and may be removed if better adjustments are made in the machinery of operation of the Industrial Boards.

The war crisis, with its war risk insurance act covering compensation, rehabilitation and reëducation of service men, led to the Federal Rehabilitation and Reëducation Act for Industrial Cripples in 1918. Since 1917 the results obtained through combined medical and social treatment of war cases have inspired some intensive social case treatment from hospitals or social organizations where these cases have been found. Nurses were in such demand that social workers without nurses' training were used, and those with experience and training proved so valuable that schools for the training of psychiatric social workers were established—one at Smith College in 1918, and courses in New York and Chicago the following year. Courses of training were designated to give the social worker special insight into the personality of the nervous and mental patient. A great many cases have now been handled by workers thus trained and the cases here presented have been studied in the clinics to which the authors had access.

CASE REPORTS

Case 1. Patient, age fifty, was born in Syria. His wife and two children returned to Syria, and patient has since lived with his married niece and her family in a fairly comfortable tenement. He was run over by an automobile in 1917 and suffered lacerations of eye and abrasions of left leg. An X-ray showed one rib cracked but other bone conditions negative. After one month in the hospital he was sent home, with an award of \$11.00 a week compensation from the Industrial Accident Board. In 1919 he was sent to the hospital for stomach trouble, and was referred to the nerve clinic, because he walked with a lurch and a shuffle, jerked his head constantly, and was nervous and emotional. A diagnosis of traumatic neurosis was made. His family reported that he was good natured at home, had a good appetite, and slept well, but had steadily refused to work and spent his time playing cards. His family had urged him to work and the Industrial Accident Board had promised to place him through their vocational department, but nothing had been accomplished. He was given electrical treatment and suggestion and his tic improved. Later he had an operation for hemorrhoids and had some teeth extracted. After recovering from the operation he was unwilling to leave the hospital. The doctor advised work for him and renewed efforts were made to place him, but after a month the patient was again in the hospital. The Industrial Accident Board decided that he was a pure malingerer and withdrew his compensation because one day, when he grew very angry in their office, all his twitching stopped. Some relations decided to send him to the poorhouse, but he had saved \$100.00 and a private social agency contributed enough money to send him back to join his family in Syria. The part played by the Social Service was that of investigating home and family conditions, collecting information from various clinics and hospitals and securing the coöperation of a relief agency.

Case 2. An Austrian Jew, age thirty, who has been in the United States four years; has a wife and two small children. He is a metal worker with an average weekly wage of \$25.00, though just previous to his accident he had earned as high as \$45.00 a week. He was thrown from an electric car and taken to the hospital in an unconscious condition. After twelve days he was sent home, but there he was very nervous and restless; talked a great deal, and kept saying, "I am no good," but had no recollection of the accident. He suffered from headache and pains in all parts of the body, was irritable, ate and slept little. After ten days at home he was sent to the hospital again. Reports from physical and neurological examination were negative. Patient had no hallucinations and showed insight but forgot what he had said, and worried about his family and their financial condition. A diagnosis of traumatic psychosis was made. Social Service made arrangements for convalescent care and watched the financial and employment situation. The patient and his wife adjusted themselves to this situation without much help. Six months later patient was working full time. He had received \$500.00 com-

pensation, and everything was satisfactory. Social Service supplied skilled assistance and encouragement during a crisis until the patient and family were able to resume their former independence.

Case 3. Patient, a Hungarian Jew, aged forty, has been in the United States twenty years, and has a wife and four small children. His wife is excitable, there is marital discord, and the children are not well. Patient has worked as a horseshoer and junk dealer, and had had as many as six men under him. Two years previous to his examination he was thrown from a wagon, fainted away, and was ill in bed for three weeks. Since then he has suffered from headache, weakness, loss of sleep, and nausea; becomes exhausted at the slightest effort, and worries over his family troubles and over a law suit pending. His psychometric examination shows a mental age of eleven years and two months. His physical, neurological, and Wassermann examinations were negative.

Social Service provided the patient with a small vegetable store where his wife worked with him. This proved to be financially successful and kept the patient contentedly working as he had never done since his accident. Social Service fitted the patient into the kind of work which suited his taste and mental ability, and made it possible for him to get along amicably with his wife.

Case 4. Male, age forty, fell from a construction crane, suffered a fracture of four ribs, both wrists, scapula, and skull. After recovery he worked irregularly as operator of a movie machine, but was not able to support his family. Three years later he was sent by the Industrial Accident Board for psychiatric examination. There was a loss of strength of both wrists, and anesthesia of the left side with some impairment of left eye, hand and arm. His orientation was good, insight and judgment fair, memory poor, Wassermann positive, though patient denied infection; lumbar puncture was negative, and no organic condition could be found to explain the anesthesia of the left side. Psychometric tests showed a mental age of eleven years and eight months. The patient complained that the noise at work bothered him, he could not concentrate, or remember. His wife reported that "in sex matters he had never been the same since the accident." A diagnosis of traumatic hysteria was made and psychotherapy recommended, but owing to special conditions in the hospital the patient did not get it.

For two months after his accident he had received \$13.00 compensation a week. At a later period he had received \$10.00 a week for six months. His family had loaned him money at other times when he was in need. The Industrial Accident Board was not satisfied and sent the patient to several outside specialists and lawyers. Eight months later the physical and mental symptoms and employment situation were all as doubtful and unsatisfactory as at first.

Case 5. The patient, thirty-four years of age, has a wife and two small children. He had worked in a hat factory where he sometimes

earned \$24.00 a week, and was known as a healthy, friendly, generous, ambitious man. In 1915 a weight struck him a glancing blow on the head and he fell thirty feet, landing on a moving belt. There was a slight scalp wound but he was not unconscious and worked for two days; then started vomiting and complained of dizziness with pain in the back, head, and eyes, and was unable to work. He tried two light jobs but gave them up and was given compensation. At home he was irritable, unsocial, and apathetic. Seven months after the accident he was sent by the Industrial Accident Board for psychiatric examination. Physical and neurological reports were negative; psychometric showed a mental age of eleven years and two months. A diagnosis of traumatic neurosis was made, and patient reported occasionally to different physicians in the out-patient service. Sixteen months after the accident he was referred for social service. From that time on he and his family received intensive social treatment for four years, from three different social workers. Compensation was secured from the Accident Board, but it was only for partial disability, was inadequate, and had to be supplemented at times from outside sources. His wife and children received necessary medical attention, and provisions were made for family recreation. The patient was encouraged and his full cooperation secured. After three months he was placed as elevator man in a quiet apartment house. He seemed to make an honest, cheerful effort to hold his job, but in a month his stomach troubles returned. Under social service encouragement he stayed at work, but two months later he complained about his back, then about his head and stomach, and objected to his work because the air was stuffy and he had to be confined for long hours seven days in the week so he could get no sunshine and no recreation with his family. Later, when the settlement of compensation came up, his stomach symptoms returned, but he was kept on the job with partial disability continued. After seventeen months of practically continuous work his complaints were so strong that he was given one free day out of seven. He showed some improvement, but still wished to change to outside work. At the prospect of shoveling coal outside he started vomiting again. After a month he found work for himself assembling machinery where he earned \$8.00 a week more and had a day and a half with his family, but he disliked the noise and confusion, had trouble with his eyes and stomach, and a numbness of one side. After two months, men were laid off and patient went back to elevator work of his own accord. There his symptoms returned and grew worse until he decided he would try shoveling coal, but that made him sick for two days. Glasses were provided for him, and his symptoms, though persistent, did not keep him from work. He was placed in a factory but at light work, because he refused to work near machinery. There he did well for ten months, when it was arranged that he should be promoted to a well protected machine job where he could earn more money. Then he was so sick that he had to stay at home for several weeks with his old symptoms and admitted he

was afraid of machinery. During the time of his successful factory work he had taken a course in English composition in a night school, which he had started on his own initiative and kept up for several months with great enjoyment. For special reasons, social service supervision had to be dropped. When left to himself, patient stopped work, his symptoms returned, and his physician recommended a lump settlement. Six months later the case was still unsettled, the patient still out of work, and his symptoms still persistent.

Social Service put much time and energy into handling this case. The lack of consistent and effective psychotherapy and of decisive action of the Industrial Accident Board hampered her work so seriously that the patient had to be left in a state little better than he was when treatment began.

Case 6. Patient was injured when working around a steam shovel, by a falling stone which cut a gash in his forehead. He was in bed two weeks, complaining that his side was weak and that he "felt afraid." Three months later he was sent for examination, and physicians reported that no evidence could be found of any traumatic brain disease or neurosis, and that the injury had nothing to do with his present condition. The Social Service secured employment, but patient refused to coöperate. The Industrial Accident Board awarded a lump settlement of \$200.00. Patient secured work for himself and worked steadily at \$25.00 a week. The records on this case suggest the patient was a successful conscious malingerer.

Case 7. Patient, age forty-two, has a wife and four children. He was injured in October, 1915, when engaged in unloading a fruit steamer. The lid of a fruit box fell seventy feet and struck him on the head. He was dazed and blinded for a time, but believes that he was not unconscious for he walked home later in the day, and thought he was all right except for a "terrible pain in his head." From that time he worked very irregularly, because he suffered from pain and pressure in his head, felt dizzy and moody and depressed, and had a "memory defect." He had received small compensation awards twice before, for a slight injury to his foot, but he made no application for compensation after this accident. A letter from a general hospital dated April 28, 1921, reports "patient was here April 19 and 20, 1916"; the diagnosis was "syphilis of cerebrospinal meninges(?)." The hospital records show that patient gave a history of chancre twenty years previous, and that the Wassermann and lumbar puncture reports were negative; the luetic clinic shows no record of patient because all negative reports are destroyed; the surgical record shows that X-rays were negative, but gives a diagnosis of "concussion of the brain and probable fracture of the skull"; a private physician gave a diagnosis of "nothing wrong except patient seemed to have compensation on the brain." The compensation worker at the hospital said she did not make out application for compensation because she could not get any definite diagnosis and because patient could not prove the time and date of his injury.

The records of the Industrial Accident Board show that "the accident occurred October 7, 1915, but was not reported until May 15, 1916. On December 7, 1916, at a hearing before the full commission, a resolution was passed denying claim for compensation on the ground that employer had been prejudiced on account of the late notice of injury as filed by the claimant. (This is pursuant of sections 20 and 23 of the New York State Workmen's Compensation Law.) The diagnosis was posttraumatic neurosis following concussion of the brain and probable fracture of the skull. No mention of syphilis was made. The lawyer for the steamship company reports that when the case was brought up before the commission in December, 1916, three members of the hospital staff were present and the case was disallowed because it was proved that the patient was suffering from syphilis and was being treated for blood disease, not for fractured skull, and that the stenographer who reported the hearing died before the notes were transcribed. In 1918 patient had an operation at another hospital for auricular cyst and was discharged cured. Later in the same year he was examined at Cornell clinic, and a diagnosis of "Traumatic Constitution with Defect" was made. No luetic symptoms could be found. The doctor gave him treatment and in 1920 referred him for psychiatric social service and recommended he should be given light outdoor work where no lifting and no stooping be required. During the four years since the accident he had received twenty-five cent grocery tickets from the priest occasionally because "no one in the parish should starve," then the priest scolded him for being a lazy, shiftless man who would not be responsible for his family. A relief agency carried the family, helped him to work, sent two undernourished children to a convalescent home in the country for six weeks and finally sent the patient for psychiatric examination. "They question if he is not a malingerer."

The psychiatric social worker collected the information here summarized and got a clear idea of the patient's mental and physical condition from the examining psychiatrist, so that she was able to encourage the patient with discerning sympathy, and keep him reporting to the clinic as advised; she had him reinstated in his union, paying up his back dues; she helped to find work for him when he was unable to do so himself; she investigated and provided for the health conditions of the whole family and the school conditions of the children; she was not able to secure a rehearing before the Industrial Accident Board because longshoremen are no longer under their jurisdiction. She gave a report from the psychiatric point of view to the relief agency, but in spite of that and the physician's report they closed the case on the ground that the patient "should be able to support his family". She then explained the case fully to another relief agency which promised to make a constructive plan for him and his family and to see that he had such work as he could do, and that the family had necessary funds for proper care.

Case 8. Patient is a Russian Jew, aged forty-two, unable to read or write in any language, a plasterer by trade, and a steady

worker up to the time of the accidents in 1917. Previous to that time he had earned \$22.00 a week; since that time he has not been able to work because he is certain there is something wrong inside his head. First he fell from a street car, and four weeks later he fell 25 feet from a building. He was unconscious for one-half hour after this last fall and could not talk for some time. Three years later he was sent for examination. Syphilis was denied, Wasserman was negative, family's and patient's previous history negative, and a diagnosis of "cerebral concussion" was made. Electrical treatment and massage were given, an operation on the nasal septum was performed at the Eye and Ear Infirmary, and treatment for pyorrhea was given. At a neurological clinic a diagnosis of "psychoneurosis, anxiety type with furunculosis" was made, and patient was referred to psychiatric social service for encouragement and part time work, because all his symptoms were functional. Patient's wife was also a neurotic, worrying type. The situation was carefully explained to them both, and patient was urged to apply himself earnestly to part time work, but this he refused to do until the Industrial Accident Board threatened to withhold all compensation unless he did. With encouragement he then tried several different kinds of part time work, and improved so much that he felt able to try full time work, after seven months of encouragement. The Industrial Accident Board had been urged to show a sympathetic attitude toward the patient and partial compensation had been continued to this time. Patient refused a settlement of \$75.00.

Case 9. An Italian laborer, age thirty, has lived in the United States six years and has a wife and two small children. In August, 1919, when lifting a rock, he "felt something give way in his back"; he has been unable to work since. The Industrial Accident Board awarded him compensation until June, 1920, when a report was brought that he was working on the dock, and compensation was stopped. Patient insisted he had never been able to work since his accident because his back hurt so he could not bend at all, and could not sit down. A detective was engaged to follow him but never caught him sitting down. After the Industrial Accident Board had refused his claim for six months they sent him for psychiatric examination. Exhaustive physical, orthopedic, and neurological examinations gave negative reports. He was recommended for psychiatric reëducation, occupational therapy, and social service, all to focus upon the idea that he was able to bend his back, to sit down, and to work. Patient refused to see the doctor or to try occupational therapy in any form, but he and his wife encouraged social service investigation, until they understood fully that it was useless to beg for money and that no special influence would be used upon the Compensation Commissioners, but that the patient must learn to work by daily increasing efforts to do so. Then he dropped his claim and disappeared.

Case 10. A Polish iron molder, age forty, who had been in the United States 19 years, and had worked 11 years in the same place, was known as a steady, hard-working, honest man, with no bad habits. He had earned about \$36.00 a week. He had a wife and four children. His wife was irritable and when she scolded he hit her. Both refused to tell the reason of their quarrels. When lifting a weight he "felt a lump come on one side, and he knew his back was broken". He claimed he could not walk and stayed in bed. He refused to apply for compensation or to allow any one else to do so. Five months after his accident, complete examination gave negative reports. When intentionally neglected he did walk. He had been treated with a supporting belt and a slight operation by a private physician, but was unimproved. Psychotherapy, massage, straps for his back, and electrical treatment, made little change. Patient tore off the straps and opposed everything the doctor tried. Social Service arranged to take full responsibility for the family, placed the patient in a convalescent home, and persuaded him to take regular treatment. Away from home he improved immediately. He ate and slept well and walked out every day. After one month the doctor advised the patient to return home, but he refused until the doctor threatened to have him committed to the state hospital. Previously the patient had insisted that he was too sick to ride on a street car, but he went home alone on the car. At first he said he was well at home, but in a few weeks all his old symptoms returned. He stayed in bed and had to be fed; he fought against being cleaned and refused to be seen by any doctor, and about a year after the beginning of his trouble he was committed to a state hospital. Two years later he was still in bed in the hospital and would starve when he was not fed.

Case 11. A Lithuanian, age thirty, had been in the United States eight years, and had worked in factories most of that time, though he had been a farmer in Russia. He had worked in a shoe factory for four years and sometimes earned \$45.00 a week. He was recommended by his employers as a satisfactory workman and was friendly and sociable among his fellow workers. He had a wife and two children of whom he was very fond. In 1917, during the Kerensky government in Russia, they believed Russia was "like heaven", so she took the two children and went home to visit her old mother who was ill. The counter-revolution came shortly after she reached home, and she was never able to escape from the country. They corresponded and patient sent her money for more than two years. Meantime he lived with his married sister. In September, 1919, he fell through a floor and hit his side on a wooden box. The company doctor strapped his side and after two weeks tore off the straps and ordered him back to work. The patient resented the doctor's manner, felt that he had been roughly and unfairly treated, and after one day of work said he had a pain in his side and claimed compensation. This was granted for one month. He worked a few days and then claimed more compensation. After several hearings

of the Industrial Accident Board he was awarded partial compensation to December 9. "An impartial physician" then reported that he had entirely recovered and should resume work. The patient insisted he was still sick with pain in his side. He went to a hospital where X-rays showed no definite evidence of a fractured rib, but there was some soreness. Later he was discharged cured. He then went to another hospital where an exploratory operation was performed and the end of one rib removed, with permission of the company physician and the medical advisor of the Industrial Accident Board. At a rehearing of the Board he was awarded full compensation for the ten weeks of his hospital stay. The patient demanded \$1,000.00, refusing to accept the \$200.00 which had been awarded him. He stopped writing to his wife, refused to attempt any work, and devoted his whole time to employing lawyers to fight his case. Five different ones started and dropped it because they could get no pay. The patient haunted the office of the Accident Board for several weeks, talking excitedly to any one he could find. The state police removed him several times and then took him for psychiatric examination. All reports were negative and patient was recommended for psychiatric reëducation, occupational therapy, and social service. He was antagonistic to the doctor from the very first, and only profanity resulted from their interviews, but he loved basket-making which he had done in the old country, worked happily and steadily the full time he was allowed in the occupational room, and made perfect baskets which he presented to his little niece. If compensation was mentioned in any way he talked excitedly but he could always be calmed down and diverted; then he was polite, humorous, and thoroughly coöperative. He was devoted to his church and priest, who encouraged him to demand \$1,000.00 or nothing. First, Social Service carefully explained to all these people that the patient should accept \$200.00 because he could not get \$1,000.00; that friends should not lend him any more money because there was small chance of ever getting it back; that the patient could work outside as he had done in the occupational room, and even if he did have some pain at first it would gradually disappear as he grew accustomed to work; that everyone had to work sometimes when suffering from pain and illness, but a real man made little of this, and he was such a fine, strong man that he was better able to do that than most people. Arrangements were made through a special committee that had power to do so, to locate the patient's wife and children in Russia, to see that they were properly cared for, and bring back a report. The friends promised not to help him with more money, but to urge him to get back to work and to take \$200.00. They kept their promise and he spent several days hunting for work, but it was a period of depression when men were being laid off everywhere, and he did not succeed. He had not actually promised to take \$200.00 and drop his claim, but up to this point he had promised to do everything as advised. At the next interview with the doctor he was so profane and noisy that

the doctor refused to see him. Left to himself he wandered about the hospital in unaccustomed places, was arrested by order of the physician, and sent to jail for disturbing the peace. From there he was committed to a state hospital, seventeen months after his accident, where he refused to work but appeared to enjoy himself immensely. He seemed perfectly normal except when compensation was mentioned.

Case 12. Patient recently discharged from army service was injured in a jitney accident. The diagnosis was traumatic psychosis. He had previously been in mental hospitals, both in and out of army service. He improved so much with occupational therapy in wood carving that Social Service arranged for him to be employed at wood-work outside the hospital under the supervision of his local Red Cross.

Case 13. A man of sixty-six, complained of nervous symptoms and said he was unable to work. Vocational adviser of the Industrial Accident Board placed him several times to convince him that he could work and at the end of one year he had been working steadily for several months earning \$20.00 a week.

Adler's (1) idea of team work necessitates a change in the law so that a psychiatric social worker could be connected with the Industrial Accident Board and the Vocational Rehabilitation Service, for, as Southard (17) says: "Most social agencies dislike to enter a case of this sort on account of the prior authority of the Industrial Accident Board and the peculiar financial and legal aspects that such a case presents." Some doctors believe that the only solution for the problem of "litigation hysteria" is to deny all compensation; others believe this would not reduce the cases more than 50 per cent. Mayer (13) thinks the law should give physicians the right to examine patients at some future time. He approves the Danish system where compensation is given on the recommendation of physicians, and believes that all testimony of physicians should be placed on file by their county societies.

Dr. Dana (6) reports 2,500,000 accidents in New York State, for which \$120,000,000 was spent in one year: One and one-half per cent of this was for medical attention. Fifteen per cent of the cases complained of nervous symptoms. In Massachusetts there were 65,688 tabulatable injuries of which 59,553 were insured, and there were \$6,260,691 of insurance payments, in the year preceding June 30, 1920; 25,430 cases, or less than half, received medical services, while only 5,585 cases had compensation. Not more than 5 per cent of accident cases ever come to the attention of the Indus-

trial Accident Board. There is no system of reporting and no estimate is made of the percentage or of the number of those complaining of nervous symptoms, or of those considered malingerers. But there are enough to exasperate the commissioners. One commissioner felt that the real trouble lay with the insurance companies, because the men who make the insurance adjustments with the workman treat him without understanding, make the symptoms worse, and actually prolong the period of compensation. He cited one instance in which the adjuster said to a hysterical girl: "You great bum! Do you think we're going to carry you forever?" His manner toward her usually made the girl sick in bed for a week after each interview. Lack of understanding of the true nature of these cases causes this lack of coöperation and results in a serious handicap to the patient, a higher expense in insurance payments, and a loss to the community by increasing dependency. But to get at the true nature of each case is no easy matter. It requires time, patience, and psychiatric training. And even after the personality is understood the treatment is not simple. Some financial aid is certainly necessary but periodic payments tend to increase hysterical symptoms, and since the treatment is often prolonged it is difficult to know how much of a "lump sum" should be awarded. Nevertheless, we feel sure that an early decisive settlement, followed up with properly organized psychotherapy and social understanding and adjustment would be of great benefit in cases like the ones quoted above.

Few statistics are available from the states. Wisconsin seems to have made advances; a commissioner reports that "employers, insurance carriers and commissioners have reached a fairly definite understanding of these cases. In coöperation with the physicians we try to estimate the probable further disability that will ensue and dispose of the case by payment in lump of the compensation." The Oregon plan is interesting in that there are no insurance carriers but all cases are compensated from a state fund. Only a few cases are referred to neurologists, as a great majority of them recover early. In many of the cases it seems that a "lump sum" settlement would be the fairest and (from the psychological point of view) the best method of dealing with the situation, but Crownhart,(5) of the Bureau of Labor Statistics, emphasizes the fact that lump sum settlements give the insurance companies the better opportunity to take advantage of the injured man's ignorance and cupidity.

In general it certainly seems true that treatment of traumatic neuroses would be much more effective if better control of the en-

vironment could be arranged by securing closer coöperation between the Industrial Accident Board, the insurance companies, the psychiatrist, and the social worker. Social work with the individual and his personal environment will then give better promise of success. The most important difficulty is the lack of prompt attention, of early diagnosis and efficient reconstructive treatment. To accomplish this a campaign of education directed particularly at those who have to do with the administration of industrial laws is urgently needed. Insurance carriers and their medical departments should be approached, and the neurological and psychiatric societies should be made to understand the magnitude of the problem from its economic and medical standpoints.

It is, of course, impossible to draw any conclusions from so small a series of cases, but even in these thirteen certain problems repeatedly present themselves. In the first place, four of the patients were considered as possible malingerers. Case 1 had his compensation cut off because the Industrial Accident Board observed him under emotional stress and saw the symptoms of tic disappear. Case 7 is somewhat similar, showing a protracted period of various neurotic ailments, with attention fixed on compensation, but litigation did not become a factor until he had been incapacitated for several months. Cases 6 and 9 are different. Both these patients immediately made much of their accidents and disappeared after settlements were obtained. In these two it seems as if there was a conscious and fraudulent plan to obtain money. Whereas in the other (Cases 1 and 7) the fixation of attention on compensation only became conspicuous after weekly awards had been received and the cases had dragged along for months. Such patients might well have psychological disabilities for which they ought to get compensation, but the atmosphere of uncertainty and litigation is well calculated to arouse feelings of unfair treatment and self-pity which would certainly increase their symptoms beyond the limits for which compensation could reasonably be expected to be given. The line between consciously planned malingering and an emotional exaggeration of symptoms is an impossible one to draw. It would seem wise to give the patient the benefit of the doubt, and consider practically all malingerers as inherently psychopathic; treat them as patients and try not to take a moralizing attitude, but gain the confidence of the patient and get him back to work even if he does not seem to "deserve" the help.

"Lump sum" settlements have frequently been tried. From the psychological point of view they are the logical methods of

compensation, but they should come quickly after the accident and be decisive and final in order to carry any psychotherapeutic effect. When attempted too late, as in Case 4, they are useless, and only aggravate the patient's antagonism. But in making an early decisive settlement it is hard to be fair to the patient; it is perhaps entirely too easy to be unfair. The patients are, however, in no way bound to accept any one doctor's diagnosis, and, as in Case 7, they may wander from physician to physician, retarding and complicating any just settlement. Case 2 appears to be one in which the "lump sum" helped the patient over a period of months of incapacity, and satisfactorily saved him from perpetuating his symptoms. Case 6 reads like that of Case 7, a successful malingerer, but at least he had no reason to be dissatisfied and returned quickly to economic efficacy.

The crux of the matter seems to lie in avoiding delay. This is difficult but might be partly accomplished by bringing all cases with any possibility of neurosis to a psychiatrist immediately after the injury, thus giving important consideration to the possibility that prolonged examinations and weekly payments may perpetuate symptoms in even slightly neurotic individuals. The great harm done by procrastination and indecisive action is illustrated in five of these thirteen cases: Case 4 is an example—a patient who after severe injury is unable to work effectively and is finally recommended for psychiatric examination at the end of three years. Even then the treatment recommended was not carried out, and the patient obtained no relief. To carry out proper treatment, organization and equipment are needed, and at present such well organized therapy is almost impossible to find. Case 5 is even more conspicuous, for here we seem to be dealing with a comparatively simple psychological mechanism, *i.e.*, fear, showing itself by various neurotic symptoms, mostly referable to the vegetative nervous system. It is the general experience of psychiatrists that such cases are curable by explanation and reëducation if treatment is begun shortly after the trauma, but in this case it was several months before he was properly examined and sixteen months before Social Service took up the treatment of his environmental conditions. Even then much was accomplished but the work was neither consecutive nor intensive enough to give a permanent improvement.

Case 7 is another example of delays and indecisions. The patient went from clinic to clinic without any regular plan of treatment. In Case 8, even after the year of invalidism, a cure was accomplished by the firmness of the Industrial Accident Board in

insisting on part time work, and the sympathy and encouragement given by the social service. A certain type of individual cannot be stopped from going to many doctors and many lawyers, thus rehearsing his troubles and increasing his symptoms. Case 11 illustrates how a slight accident and unsympathetic treatment to a man already burdened with cares may start a litigant trend. He goes to several hospitals, is discharged "cured" from one, is pronounced "well" by another physician, but is subsequently operated on. Differing opinions confuse him, his burden of cares, his self-pity and ideas of persecution depress him, and he finally becomes distinctly psychopathic. Firm, kindly and thoroughly explained treatment in the beginning might greatly lessen the number of these litigants.

Saying that all malingerers and neurotics are mentally abnormal before their symptoms appear is begging the question. It is like saying that all criminals are psychopathic. A truer statement of the facts would seem to be that all of us have our limits of mental or moral strength; it takes varying degrees of environmental pressure to break us down, and the line between the mentally normal and abnormal is merely the line between those who can offer more or less resistance to the pressure of the circumstances tending to cause a breakdown. Thus the line must be a purely arbitrary one. Nevertheless we have our "common sense" standards and can judge pretty well what is meant by the terms ordinarily applied. Of our cases, two (10 and 12) appear to be distinctly psychopathic. Cases 3, 4 and 7 seem to be individuals of inferior make up, two of them possibly syphilitic. From a general review of all the cases it appears that eight were helped by the work done for them, and five were not benefited. Though only thirteen cases are here presented they represent the stream of neurotics flowing through the offices of the Industrial Accident Boards. These cases are now classified under the generic term "malingerer". Can this stream be used to make those offices a fertile field for the cultivation of mental hygiene in industry? If so the community can be spared expense and exasperation, the patient can be spared suffering and some forms of social unrest may be ameliorated.

SUMMARY

This study suggests that social work with traumatic neurosis should shape itself along two different lines:

- (1) Administrative—in giving a fair understanding of the true situation to all persons who must come in contact with the patient, in order to secure the necessary team work.

(2) Therapeutic (after the administrative problem is under control)—in allowing the social case-worker to affect the permanent readjustment of the neurotic patient to his environment.

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CASES OF LIPODYSTROPHIA PROGRESSIVA

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Lipodystrophia progressiva is a disease which begins in childhood or early youth and is characterized by the gradual disappearance of the subcutaneous fat on the face, the arms, and the upper part of the body, while the adipose tissue on the lower part of the body is normally or even more than normally developed.

As the illness is rare and its etiology is still unexplored, I will here describe a case I have recently observed.

Eve L., aged six years. Father deceased of pneumonia. Mother was treated in April, 1920, in the Ostersund Public Hospital for lues secundaria. She never had luetic symptoms before and does not know anything about the time of infection. Parents not akin. Eve is the youngest of thirteen brothers and sisters. The eldest brother died of pneumonia. One sister, the eldest but one, died of tuberculosis. The next six children are alive and healthy. The three following ones died early, one to three weeks old. The youngest child but one is alive, healthy. The mother had an abortion following the first child. Eve was very little and delicate at her birth. The progress of the delivery was normal. She was brought up with the bottle, has always been healthy and has had no children's diseases. During the last year she has got thinner and has gradually reached her present emaciated appearance.

Status: On seeing the girl one immediately is struck by her emaciated features, which are like those of a thin, old woman. The cheeks are hollow, the cheek bones protruding, the chin pointed. The skin seems to be stretched tightly on the skeleton without any layer of fat between. Tubera frontalia et parietalia are strongly marked, vertex does not have the normal shape, but is somewhat flattened. The conspicuously marked tubera frontalia and the pointed chin give to the face a triangular shape. No saddle-nose. The neck, the arms and the chest are also very thin. Below the umbilical plane, however, the subcutaneous adipose tissue is normally developed and gives to the body the round forms of an average six years child.

Everywhere, both on the upper and lower halves of the body, the skin is drier than normally. In some places a slight desquamation is noticeable. The color of the skin is on the whole pale and grayish; especially around the mouth the grayish tone is conspicuous. On the fingers the skin is of a lively red, thin and glossy. On the face, the neck and the chest the skin can be lifted in large, thin folds, which can not be done on the lower half of the body. On account of the elasticity of the skin these folds disappear immediately, without leaving any trace. The hair of the head is thin and dry and comes down to the shoulders. No lanugo hairs on the body. Axillary and pubes hairs, none. The nails normal. No dermatography. Behind the maxillary angles and on the neck there are numerous hard, easily

movable lymphatic glands varying between the size of a pea and that of a bean. In front of the ears and on the back of the neck as well small, palpable glands. Numerous glands, about the size of a pea in the groins and arm-pits. On both arms immediately above epicondylus medialis humeri there is a small palpable gland. The tonsils are somewhat enlarged. The isthmus of the thyroid gland can be felt by touch, but is very thin, allowing the tracheal rings to be felt right through it. No dullness of the thymus when percussed. X-rays show a normal sized sella turcica. No thickening of the epiphysis; no rachitic rosary. In the mouth there are 20 milk-teeth. The front teeth considerably decayed. No Hutchinson type. The tongue is small and thin. She is keen and intelligent and mentally quite normally developed. Feels strong and healthy. Length, 103 cm.; circumference of head, 47 cm.; of chest, 52 cm. Weight on admission to the hospital 14.5 kg.; after two months plentiful nutrition in the hospital, 15.1 kg. The upper half of the body equally thin as on arrival.

Heart, lungs, liver and milt without remark. Blood pressure 95 mm. Hg. Pulse 80-100.

Blood: Red corpuscles 4.8 mill. Hemoglobin 90 per cent. White corpuscles 13,000 per cubic mm. of which neutrophile 42 per cent, eosinophile 1.5 per cent, basophile 1.5 per cent, lymphocytes 52 per cent, large mononuclear and hybrid forms 3 per cent.

Pupils middle sized, round, equally large, react normally. Range of sight and fundus oculi without remark. Muscular strength of arms and legs normal. No other symptoms from the nervous system.

Urine clear; no albumin, no sugar. Daily quantity, 500-700 gm. Passes her water 5-7 times in the day; not at night.

Wassermann's reaction in the blood indistinct (0.2 cubic cm. gave 45 per cent hemolys). During her stay in the hospital she has received seven injections of salicyl. hydrarg. each 0.015 gm.

The case accordingly shows a typical lipodystrophia progressiva, complicated by disturbances of the skin, slight swelling of the lymphatic glands and Wassermann's reaction.

In the "Münchener medicinische Wochenschrift," No. 7, 1921, is found a paper by Prof. H. Klien, Leipzig, on lipodystrophia with a description of a case. He there mentions that out of twenty-three cases described in literature one was complicated with trophic disturbances of the finger nails, one with grayish discoloring of the skin, one with apparent pachydermia on the face, three with hypertrichos, one with dry hair, one with abnormal secretion from the glandulæ sebaceæ, two with abnormal perspiration, one with akrocyanosis, one with cyanosis of one hand, one with "Wärmewellen," one with polyuria, one with oliguria, one with glycosuria, one with alimentary glykosuria, one with rhinorrhoea.

Except the disturbances of the skin and of hair none of these complications is to be found in my case.

The etiology of lipodystrophia remains unexplored. Simons explains the disease as heredodegeneration in analogy with muscular atrophy. Klien, however, thinks that this is hardly probable and points out that no case is known in which the illness has been hereditary or has occurred together with other heredodegenerative diseases.

In his above-mentioned paper Klien suggests a hypothesis that the illness might have something to do with abnormal involution changes of the epiphysis. He supports this hypothesis on these grounds:

Following some diseases of the endocrine glands, various disturbances appear in the formation of fat of the body. Loss of flesh accompanies Morbus Basedowi increased formation of fat myxoedem and dystrophia adiposogenitalis, etc. So it seems natural to explain lipodystrophia progressiva as an endocrine disturbance. The thyroid gland and the sexual glands are active through hormones, which are secreted directly into the blood. A disturbance of the formation of fat, due to changes in these organs will be likely to affect the whole body and will not, as in lipodystrophia, be limited to the upper half of the body.

The epiphysis and the hypophysis, however, are assumed to influence the formation of fat by means of a sympathetic nerve center in regio subthalamica. This influence Klien assumes to be exerted either through hormones, which are transferred to the blood vessels or lymphatic vessels, or through impulses, transmitted through nerve fibers. Nerve connection has been shown to exist between the epiphysis and regio subthalamica. Now in analogy with the organization of the rest of the brain, one might assume an arrangement of the epiphysis, the nerve connections and centrum subthamicum, that makes one part regulate the formation of fat in the upper part of the body, another in the lower. Destruction of the hypophysis causes adipose hypertrophy (dystrophia adiposogenitalis), destruction of the epiphysis leads to adipose atrophy.

About the age of six extensive involution changes take place in the epiphysis. It loses its checking influence on the sexual development, but retains its influence on the formation of fat. As lipodystrophia generally begins at this age, Klien thinks that the etiology of the disease might be sought in abnormal involution changes in the epiphysis, which spread also to such parts as promote the formation of fat in the upper part of the body.

In the case described by me, Wassermann's reaction and the manifest syphilis of the patient's mother justify the assumption, that the latter disease plays a part as an etiological factor, through changes in the epiphysis or elsewhere.

SYNDROMES OF THE ANTERIOR SPINAL ARTERY

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Diseases of the anterior spinal artery are not uncommon. Most lesions of this artery refer to the spinal cord; but there are cases with involvement of the anterior spinal which are limited to the medulla. I will cite a number of cases illustrating the various clinical pictures; but before doing this it may not be amiss to review briefly the blood supply of the medulla and cord.

The vertebral artery, after entering the vertebral canal, runs upward and inward on the lateral surface of the medulla, between the roots of the twelfth nerve and the first denticulation of the ligamentum denticulatum, to meet its fellow at the lower border of pons in the formation of the basilar artery. The left vertebral is usually the larger and, frequently, when one is missing, the remaining one becomes the basilar.

The vertebral gives off the meningeal, posterior inferior cerebellar, dorsal and ventral spinal arteries. The latter, which leaves the parent trunk about one centimeter below the union of the vertebrals and one centimeter above the origin of the posterior inferior cerebellar, forms the subject of this paper. The left ventro-spinal is larger than the right, which is often absent. Many branches of the hypoglossal nerve leave the medulla above the origin of this artery.

The ventro-spinal arteries converge caudalward, and, somewhere between the foramen magnum and level of the third cervical segment, unite to form the median ventro-spinal artery. The common trunk continues downward to the end of the cord, anastomosing in its course with branches from the vertebrals and intercostals. It gives off the ventro-fissurals and the rami laterales. The former enter into the ventro-median fissure and divide into right and left branches. These penetrate the grey substance where they often divide into ascending and descending twigs and supply the anterior white column, all of the ventral and dorsal grey columns, with the exception of the most peripheral parts, and give off special branches to Clarke's column. In the medulla they supply the raphe, the pyramids and their decussation, the lemniscus, the interolivary bundles, hypoglossal nuclei and nerves, and the posterior longitudinal

fasciculus. The pyramids are also frequently nourished by the vertebrales. The rami laterales supply the ventral roots.

All arteries supplying the spinal cord and the medulla are end arteries, and therefore embolism or thrombosis of these arteries always results in an area of softening. Owing to the inconstant branching of the arteries supplying the medulla it is frequently difficult to give a definite opinion as to which vessel is involved. Generally, however, syndromes of the anterior spinal artery are fairly characteristic to warrant a definite diagnosis.

The following case caused considerable doubt:

Case I. A. L. B., fifty-four years old, an electrician, was admitted to Montefiore Hospital, June 29, 1922, complaining of weakness and stiffness in all extremities and diminished sensation from the middle of the trunk downward. His family history is irrelevant.

He had been a heavy drinker up to five years ago. He had never worked with lead. His best weight was 155 pounds and he weighs now only 140. His past medical history is unimportant, with the exception of a Neisser infection at fifteen. He denies syphilis. He married at thirty-four. His wife is well and has two children living and well; she never had any miscarriages.

His illness had a gradual onset and progress, with the following complaints occurring in sequence: (a) Pain in back of neck, first on awakening and later several times during the day—January, 1921; (b) tingling sensation of the fingers—September, 1921; (c) loss of recognition of objects by handling; (d) pain in bending the head forward; (e) feeling of numbness with contraction around the neck; (f) weakness and numbness of the legs, loss of erection—January, 1922; (g) loss of sensation in the lower extremities; (h) urination slow to start, slow stream and difficult to control; (i) burned his fingers and was not aware of it; (j) band sensation about the waist, similar to that of the neck—March, 1922; (k) motor power diminished in the arms; (l) he could do fine movements with the fingers, sooner by watching than by feeling; (m) for the past two months he had involuntary spasms and contractions in the legs and arms; (n) for the past two weeks he had shortness of breath, difficulty in speech, difficulty in swallowing food, though no choking.

On physical examination the patient presented a quadriplegia with hypertonia, hyperreflexia and spasticity. The paresis was greater on the right than on the left. There was a bilateral Babinski and Hoffmann but no Clonus. The abdominals were sluggish. The cremasterics were present. His sensory examination showed hypesthesia, hypalgesia, hypothermesthesia from C² down, slightly lower on the right, most marked in the upper regions. Loss of pain sensation was greater on the left side. The sacral area was normal. The vibratory sense was diminished from the midcervical and lost below the sixth rib on both sides. Sense of position was

absent in the fingers. The pupils were equal but reacted to accommodation better than to light. There was a bilateral corneal anesthesia. The face was unaffected. The neck was held rigid. The ocular muscles and tongue were not involved. The masseters and pterygoids were weak and the soft palate was hypesthetic. There were spasmodic jerks of the abdominal muscles.

The laboratory examination was negative throughout, except that the cerebrospinal fluid which was under tension and slightly yellow. The clinical diagnosis was an extramedullary tumor of the upper cervical cord with a bulbar palsy as an acute complication.

Dr. Elsberg did a laminectomy, exposed all of the upper cervical region and found a subtentorial tumor. The patient's condition would not permit a further exposure. He died four days later of bulbar paralysis. Autopsy revealed an aneurism of the right vertebral artery, atrophy of the medulla and the upper cervical cord.

Case II. J. L., twenty-five years old, a musician, had a chancre at sixteen, for which he received local treatment. He developed no secondaries. His habits and family history were unimportant. He was admitted in May, 1921, to the Montefiore Hospital, with a paralysis of all four extremities. This began suddenly in July, 1915, when the left upper, left lower and right upper and lower extremities were affected one after another, all in a few moments. Consciousness and memory were and remained clear. There were no auditory, visual, rectal or vesical disturbances. He could not speak properly and was not understood. His face was drawn to the left; he was unable to swallow. Mastication and taste were unimpaired. Later he became somewhat stuporous and had projectile vomiting. At the time of his admission to the Mt. Sinai Hospital, he had mild fever, slight restlessness, marked nystagmus in all directions, deviation of the tongue to the right and spastic paralysis of all four extremities, a bilateral Kernig, a bitemporal pallor of the discs and a positive serology for syphilis. He received nineteen intravenous salvarsans.

His condition improved so that at the time he was admitted to the Montefiore Hospital he had a quadriplegia of the upper motor neuron type, in which not all the extremities were affected alike. There were no disturbances of sensation and no involvement of the cranial nerves. Except for slight improvement his condition has remained stationary, and the serology negative.

Medullary hemorrhage in the region of the pyramidal decussation seems to be the most probable diagnosis. From the history and absence of other findings, one may exclude a lesion elsewhere. It is, however, difficult to determine even after tumor and meningitis have been excluded, on account of the more or less stationary condition of the patient, whether the vertebral or the spinal artery is the seat of the injury. Both supply this section of the medulla. The latter is the more frequent contributor because the decussation is too low to receive its blood supply directly from the vertebral, unless the anterior spinal is absent.

Hematomyelia of the cervical region as a result of a hemorrhage

from the anterior spinal artery may also give a quadriplegic picture, as the following case will illustrate.

Case III. B. P., thirty-two years old, a housewife, developed acutely a spastic quadriplegia with loss of sphincter control eleven weeks after a confinement. There was no diplopia, no fever or speech disturbance. There was no history of syphilis and the serology was negative. The spasticity gradually cleared up, leaving her with slight loss of motor power in all four extremities, the right upper remaining most affected with atrophy of the interossei, the left lower next and the other extremities least. There was a belt of hyperesthesia from C³ to D¹, anteriorly and posteriorly, which has cleared up; and there is left a thermoanesthesia and an analgesia from D² downward, including the sacral segments.

Case IV. A. G., forty-nine years old, an artist, entered the Neurological Institute on March 14, 192—, complaining of progressive weakness of both hands, the right more than the left; with inability to extend the middle, ring and little fingers of the right hand; button his clothes or feed himself. This condition commenced about four years prior to admission, with contraction of the right thumb and thinning of the right hand, particularly in the region of the small fingers and thumb. In 1918 the same condition commenced and progressed in the left hand. In the latter part of 1919 the last three fingers of the right hand became flexed with inability to extend them. In 1920 he began to feel quivering sensations in both arms and the upper part of the abdomen. Three months before admission to the hospital he noticed that he was unable to extend the middle and ring fingers of the left hand. He has had rheumatism in his legs for the past three months.

His family history is unessential, with the exception that he has no children and his wife had one miscarriage. He had a chancre twenty-five years ago, which was treated locally. He has used paint for a great number of years and for some time smeared the paint on the canvas with his bare fingers. He had frequent sore throats but no other illnesses.

Examination: His mental condition seemed to have been unaffected. The cranial nerves were normal with the exception of the pupils. The left was bigger than the right and both were sluggish to light. The striking features were the extensive atrophy of the thenar and hypothenar eminences of both hands, the carved out appearance between the bones of the forearms posteriorly, the tapering form of the forearm despite the comparative preservation of the radial muscles near the elbow. In addition there was a drooping of the right and left outer three fingers. The thumbs were almost entirely paralyzed. Supination and pronation with either forearm were performed poorly; pronation more so. Flexion and extension of the arms were weak. There was marked weakness in the hands and fingers, particularly extension. All the extensor muscles of the forearm showed the reaction of degeneration. The same was true of

the abductor pollicis, lumbricales and interossei between the second, third and fourth fingers. Among the flexors of the forearm, some showed the normal reaction while others showed reaction of degeneration. There were fibrillary twitchings of the muscles of both arms and occasionally of the abdominal muscles. The lower extremities did not show either objective or subjective motor disorders. Of the reflexes, the biceps, triceps, radial and ulnar were present and equal. The knee and ankle jerks were present but the right was greater than the left. There was a bilateral ankle clonus. The epigastrics and abdominals were present and equal. There was a Babinski on the right. There were no sensory disturbances. The laboratory report showed a positive serology for syphilis, lead in the urine and stippling of the red blood cells.

The initial and progressive atrophy and weakness of the arms and hands, plus the laboratory findings, speak for a probable specific myelitis due to syphilitic thrombosis of the anterior spinal artery in the lower cervical region. Lead may be an additional factor in the etiology.

Amyotrophic lateral sclerosis may be excluded by the character of the onset and the course of the disease.

Case V. L. H.¹ was brought to the Neurological Institute on February 4, 1922, complaining of dizziness which was worse on raising the head, weakness of the right arm and leg and slight diffuse headaches. She improved since the onset, which happened suddenly on January 31, 1922. On this date while in the act of washing dishes she became dizzy suddenly and fell to the floor. She was not unconscious but she became incontinent and vomited with every move she made. She said "everything was going around me and the floor was falling away from me." Later she became drowsy but remained conscious all through her illness.

She received a fractured skull at the age of four and was unconscious for fourteen days, but recovered completely. For the past sixteen years she has had attacks of asthma every winter, lasting two or three weeks. For the past five years she has been irritable and had frequent urination. She had three or four induced abortions. Her husband and four children are well.

On physical examination she presented an upper motor neuron type of right hemiparesis. There was anesthesia of the right arm, trunk and leg of discriminative and deep sensibility, flaccid atrophic paresis of the tongue and nystagmus to the right and left. The Barany test showed paradoxical passpointing to the right with the left hand; coarse nystagmus and of longer duration than normal. There was an enophthalmos and narrowed palpebral fissure on the left. Her blood pressure was 168 systolic before the accident and is 132 systolic to-day. The laboratory and ophthalmoscopic examinations were negative.

The sudden onset plus the objective findings and gradual improvement are suggestive of thrombosis of the left anterior spinal artery in the midolivary region.

Wilson² cites a case of a gradual developing quadriplegia in a laborer, fifty-nine years old. His disability first developed in the lower, then in the upper extremities, followed by improvement first in the right arm, then in the left arm and last in the lower extremities.

Examination revealed an upper motor neuron quadriplegia, loss of position sense in the toes and asteriognosis in the upper extremities. The Wassermann was positive in the serum and spinal fluid. The gradual onset, the combination of objective findings, the positive serology and the sequence in the improvement, *i.e.*, differing from cortical and capsular lesions, are indicative of thrombosis of the anterior spinal artery in the region of the pyramids.

Tilney and Riley³ cite a case of hemiplegia cruciata, involving the right arm and left leg, coming on suddenly in a young man while diving and injuring his head. Their diagnosis was hemorrhage in the decussation of the pyramids. Another case which they cite is that of a man of fifty-three, who after a brief fainting spell and unconsciousness was unable to speak and became paralyzed in the right arm and leg. His speech returned but the paralysis of the left side of the tongue, right arm and leg remained. His blood pressure was 200 systolic. Either the vertebral or the anterior spinal was the site of the insult and the sudden onset points to a hemorrhage.

A third case of their series is that of a young man recovering from typhoid, who developed a complete paralysis and anesthesia of the right side of the body. Physical examination showed atrophy and paralysis of the left side of the tongue, upper motor neuron paralysis of the right arm and leg, and loss of muscle, joint, vibratory and tactile discriminative sense on the same side. There is no other place in the nervous system outside of the medulla where one lesion can give such a syndrome.

Because of the marked proximity of homologous functioning structures in the anterior part of the medulla, bilateral affections in the disease of the anterior spinal or vertebral artery occur very frequently. Either on account of posterior column disorder or cerebello-olivary tract involvement, the deep reflexes may be diminished or abolished. Ataxia may or may not be present, depending on the involvement of the lemniscus or cerebellar tracts. Of the cranial nerves, the twelfth is the most frequently affected, but never completely because of the multiple and extensive emanations of its fibers from the nucleus, so that a mild paralysis may pass unobserved. Unilateral facial involvement occurs occasionally.

As the decussation of the posterior columns takes place a little higher than the pyramidal decussation, the presence of crossed or homolateral sensory disturbances will depend upon the level and extent of the lesion.

Wilson's statement that despite the quadriplegia, be it of syphilitic origin or other vascular insult, the patient will frequently improve gradually and sufficiently to help himself and occasionally earn a living wage, is in accord with my experience.

In conclusion I may state that all the cases I have cited show lesions limited to definite anatomical structures, whose blood supply come either from the anterior spinal or vertebral arteries. Although pathological material was presented only in Case I, the lesions in the others seem to be definitely vascular in nature.⁴

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- ³ Tilney and Riley. *The Forms and Functions of the Central Nervous System*, pp. 39. New York, 1921.
- ⁴ I am indebted to Drs. E. G. Zabriskie and S. P. Goodhart for permission to use the records of the Neurological Institute and the Neurological Service of the Montefiore Hospital, New York City.

DEMENTIA PRECOX AS A TYPE OF PROGRESSIVE DEGENERATION

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The nature of the pathological process in dementia precox is obscure or at best poorly defined. Many theories have been advanced but none has received general acceptance and authorities manifest a disinclination to express positive opinions. It may be that in the present state of our understanding of mental deviations it is impossible to formulate an hypothesis that will be satisfactory to a majority of psychiatrists, nevertheless attempts to do so are justifiable if for no other reason, because of the stimulus they may give to further research.

In a recent communication the present writer (1) called attention to the selective nature of many of the progressive or hereditary degenerations and of the innate defects in aptitudes and other functions, and suggested that this relation might be of service in arriving at an understanding of the constitutional basis of the psychoses and neuroses. It is the intention at this time to enter upon a more detailed consideration of the views there expressed, particularly insofar as they are concerned with dementia precox.

The method of investigation is that of analogy, *i.e.*, of comparing dementia precox with conditions which there is reason to believe may have features in common with it. However unsatisfactory this method may be, it is with the limitations of present technical procedures the only one that appears to be available and in the present connection seems to have been productive of some results. Following the dictum of Hughlings Jackson one may assume, as a premise, that dementia precox is not a condition *sui generis* but one of a group depending on a similar pathological process or at least having features in common. Considering its apparently causeless origin and progression, we have analogies in the progressive degenerations (abiotrophies of Gowers) of which there are a considerable number affecting the nervous system. For choosing a criterion such as this, there is support in the conclusion of Kraepelin: "By these considerations dementia precox comes nearer to epilepsy; in it also besides the undeniable importance of the inherited or

early acquired constitution we have cause to assume the development of definite destructive morbid processes progressing either somewhat slowly or rather rapidly, which sometimes reach back into childhood, sometimes begin or at least experience an exacerbation about the time of sexual maturity." (2)

It is the intention to consider, first, the types and laws of the progressive degenerations, second, the relation of these to dementia precox and finally, some deductions that seem to follow.

THE PROGRESSIVE DEGENERATIONS

A survey of neurological literature quickly demonstrates that these conditions as a group have not received the attention which by virtue of their number and importance they would seem to merit. In text books they are so scattered among classes formed on some other basis than etiology that the casual student gets a wholly false impression of the size of the group which they constitute. In only a few brief articles does one find them brought together and considered as a whole. Recently Bielschowsky (3) has contributed such an article and his classification is as follows:

1. Pure dysplasias (microgyria, micromyelia, syringomelia).
2. Dysplasia with blastomatic characteristics (glioma, Recklinghausen's disease, tuberose sclerosis).
3. Abiotrophies,
 - a. With blastomatic characteristics (pseudosclerosis, diffuse sclerosis).
 - b. With total necrosis of parenchyma (Wilson's disease).
 - c. With elective necrobiosis of ganglion cells (amaurotic idiocy, chronic chorea, spastic spinal paralysis, amyotrophic lateral sclerosis, hereditary ataxy, etc.).

It was probably not the author's intention to make a complete enumeration of the conditions which belong here; at any rate his list does not contain many whose origin is not unlike that of those he does include. Some of these will be mentioned presently. The most comprehensive consideration of this subject is that of Bing (4) who enumerates some eighty conditions which may be taken as progressive degenerations and makes the following groups: Atactic; Spastic; Amyotrophic; Myoclonic; Paralytic; Trophic-vasomotor; Sensory; Neurotic; Psychic. E. Treacher Collins (5) enumerates six abiotrophies affecting the optic mechanism alone.

The present writer making his group of hereditary defects very

broad so as to include such conditions as color blindness and the aptitude deficiencies formed the two primary subdivisions:

1. Congenital and stationary.
2. Acquired and progressive.

Under the latter of these classes would fall most of the affections mentioned by Bielschowsky, Bing and others. In order to avoid confusion and to emphasize the selective nature of the pathological process in many instances, only those will be taken up which would come under Bielschowsky's strangely-labelled third subgroup. These include, among others: progressive muscular dystrophy and atrophy; Friedreich's ataxia; otosclerosis; hereditary optic atrophy; Huntington's chorea; paralysis agitans and possibly, spasmodic torticollis and trifacial neuralgia.

It cannot be maintained, of course, that the nature of these conditions is entirely definite and firmly established. Many writers in discussing different ones of them refrain from making definite statements as to etiology. Much of the confusion surrounding them is obviously due to the difficulty of estimating the influence of heredity. It is quite natural to assume that heredity is important in proportion as concrete instances of transmissions are encountered. Direct transmission or even familial involvement is certainly not the rule so far as these conditions are concerned. It is submitted, however, that such should not necessarily be the case in view of what is known of the laws of inheritance. It is well established, for example, that recessive traits may exist in an individual and be transmitted by him to his offspring, by these to their offspring and so on, without becoming manifest except in a relatively small percentage of cases. Further than this, students of heredity generally believe that a trait may remain unexpressed for many generations, eventually to crop out in pure form as if of spontaneous origin. Of the so-called reversions, which is the term applied to the appearance of features supposedly belonging to a remote ancestor, Professor Thomson has this to say: "After we have sifted out those phenomena whose inclusion under the rubric 'reversion' is illegitimate we shall see more closely what may be plausibly interpreted as due to the re-emergence of ancestral characters after a more or less prolonged period of latency." (6) Specific instances of the dormancy of traits are found in man, one which may be cited being albinism. Of this affection, Davenport speaks thus: "Albino communities . . . are inbred communities, but not all inbred communities contain albinos." (7) In other words, the trait of albinism remains latent

until strengthened by the union of two affected strains. Again, characters may appear apparently *de novo* but thereafter be in high degree transmissible. This situation is frequently found with Huntington's chorea and the neuritic muscular atrophies as well as many other conditions, and there can be little doubt that the disorder arose in the original member in the same manner as in the offspring. So in these cases the trait must have remained unexpressed in many antecedents. Still another of the vagaries of heredity is illustrated by progressive muscular atrophy. Not ordinarily transmitted, still in certain families and when having its onset in childhood it is highly hereditary.(8) Oppenheim expresses the opinion that in all these situations the same condition is represented. From these several examples, one can safely conclude that traits may lie dormant for generations and that definite evidence of heredity will not be found in every hereditary condition. One is therefore justified in tentatively subsuming heredity when the facts seem to warrant doing so.

The various types of degeneration in the foregoing list will not be taken up individually. Most of them are conceded to be of the nature which they are here assumed to be. Paralysis agitans is not often considered as to etiology, but Oppenheim writes, "Heredity is not marked although it is a predisposing cause in a good many cases," (9) and Ramsay Hunt (10) expresses the opinion that it is an abiotrophy. Spasmodic torticollis, according to Oppenheim (11) chiefly affects people of a neuropathic and psychopathic constitution. Equally obscure is the affection, trifacial neuralgia, but Oppenheim states: "Here neuropathic heredity plays a particularly important part and in many cases is the only assignable cause of the trouble." (12) Its unilaterality, it must be said, is against such a view. But these conditions are merely taken up in passing and are not essential to the main thesis. If finally included in the group they will serve merely by adding to the number and diversity of the functions which are affected.

The histopathology of these various degenerations is by no means always definite and established. A survey of the group shows that definite changes are more apt to be found when lower physiological levels are affected as in the muscular atrophies, optic atrophy and, less certainly, otosclerosis. In the cerebellar forms of Friedreich's ataxia, Huntington's chorea, and paralysis agitans it cannot be said that the nature and location of the material changes has been determined. This difference between the various levels is doubtless in relation to the degree of isolation as well as the size of the structures which are affected, and whether or not this arrangement of

structures is an affair of levels, it is certainly one of function since those having to do with integration certainly seem to be less definitely localized.

Especially noteworthy about these degenerative conditions is the fine discrimination as to the structures selected for the attack. In progressive muscular atrophy, for example, the lower motor neurone is affected from mid-brain to the tip of the cord without contiguous structures anywhere being in the least disturbed. Again in paralysis agitans structures having to do with motor integration are injured, but the presumably nearby-lying pyramidal fibers invariably escape. Once more, Huntington's chorea and paralysis agitans are entirely distinct although according to Ramsay Hunt (13) the affected structures are intimately commingled. It is evident that in these degenerations the pathological process is conditioned in its advance by function, only those structures being attacked in each case which are concerned with certain functions. In a single condition it appears that the attack is not always limited by one function but may involve two or more, somewhat related or, on the other hand, only a part of a function. No doubt the process is only centered on, and not strictly limited to, such structures. Gray (14) from his study of otosclerosis reached the conclusion that the auditory mechanism was affected from cortex to skin; and it seems likely that this principle of the involvement of biological units holds good with the other types of this process. (Foot note.) Apparently in the beginning certain structures are selected for attack and when their destruction is completed the process ceases to act. This can be seen in the relatively stationary end-state of paralysis agitans, chronic chorea and spasmodic torticollis.

One can obtain some notion of how strictly limited is the pathological process in this type of affection by contrast when it is compared with some other where such limitation does not occur, as for example, multiple sclerosis.

In the foregoing discussion the group of acquired and progressive conditions has been taken up; the corresponding congenital and stationary deviations will not be studied because they are not thought to be in correspondence with the acquired and progressive nature of dementia precox.

- Foot Note. From these conditions valuable information as to the architecture of the nervous system may be obtained. In no other way can functions be isolated and destroyed as they are by this disease process. Some selection is manifested by diseases (e.g. lethargic encephalitis) toxins (tetanus, diphtheria, etc.) stains and drugs, but not in such forms as are here found.

Summary. The progressive degenerations form a large group of nervous affections and in their several types involve diverse nervous functions of both higher and lower levels. In each type the pathological process is centered on structures which are concerned with one or a few related functions. Anatomical changes are definite in those types involving lower levels and obscure in higher level forms, a fact which is doubtless to be correlated with the size and degree of isolation of the affected structures.

DEMENTIA PRECOX

The manner in which the foregoing conclusions will be applied in the elucidation of dementia precox will now be fairly clear. Before entering further into a discussion of this point, however, consideration will be given to some of the current views on dementia precox in order to gain orientation and perspective.

Kraepelin (*Dementia Precox and Paraphrenia*) writes: "There also we come across facts which make the existence of disorders of metabolism in high degree probable. Epilepsy is also a very ancient disease and spread over the whole world. If one will, one may, to the further understanding of the relation between constitution and disease, bring into the discussion certain frequent disorders of metabolism with purely bodily abnormalities, diabetes, gout, chlorosis, the occurrence of which is undoubtedly essentially proved by inborn peculiarity"; and again, "At the outset we can say only that inferiority of inborn disposition is mainly referable to two great groups of causes, hereditary degenerations and germinal injuries." Adolph Meyer (*Brit. Med. Jour.*, Sept. 29, 1906) concludes: "Etiologically the constitutional makeup counts for a great deal but not in the vague sense of heredity and degeneracy merely. There is much more to be had in the study of deterioration of the habits and undermining of instincts and their somatic components." Ford Robertson (*Jour. Ment. Sci.*, vol. 68) states: "In my judgment these chronic bacterial infections are the most important of several factors that determine the mental disorders. They are the direct cause of the morbid process in the brain that destroys its efficiency as a mechanism and leaves it incapable of many normal motor, sensory and psychical reactions. Among other important factors are the special inherent reaction qualities of the patient and psychic traumatism." Southard (*Am. Jour. Insanity*, vol. 67) gives an excellent discussion on the genesis of dementia precox and describes some brain changes which may be regarded as aplasiae and mentions the possible causative relation of the endocrine glands. In "Diseases

of the Nervous System" by Jelliffe and White, one finds (pp. 806-824) "On the other hand for an understanding of the whole disease process it must not be lost sight of that recent investigations are tending to show more and more that there are distinct biochemical disturbances during life and pathological changes are being found after death." Again (p. 808) . . . "but it may be mentioned here that whatever its ultimate nature may be the existence of toxic factors or internal secretory disturbance is largely hypothetical so that at the present time it is more useful to formulate the upsetting factors as well as the general symptomatology in psychological terms rather than in terms of disturbance at physiological levels." From his genetic studies Mott (*Eugenics Record*, vol. 11) concludes: "Hereditary predisposition is the most important factor in the production of insanity, imbecility and epilepsy. It is the tendency to nervous and mental disease, generally speaking, which is inherited. This may be termed the neuropathic taint." Mott has described organic brain changes in precox. MacDougall (*Am. Jour. Psychiatry*, vol. 1) advances the rather startling suggestion that the pathological changes in the brain may be of psychic origin.

One perceives in these views, which perhaps may be regarded as broadly representative, a general inclination to admit the existence of a constitutional factor in dementia precox. The differences of opinion are seen to lie chiefly in the relative importance which is assigned to this factor as contrasted with exogenous exciting forces and also as to which of the latter is of primary bearing. On these points there is no possibility of reconciling the various investigators while their viewpoints are at such variance; but it would appear that one may expect with some confidence that ultimately the constitutional factor, being the invariable and specific one, will in time be generally recognized to be of first importance. A demonstration of its nature and the manner of its influence is therefore a worthy task for the psychiatrist.

The chief facts upon which the assumption of a constitutional or structural basis depends are as follows:

Anatomical Findings. These have been described by a number of first-rate investigators, notably in this country, Gurd (15) and Southard (16). That such findings have failed to be entirely convincing is due to their subtle nature and the consequent difficulty in corroborating them and also to the possibility that they may not be specific.

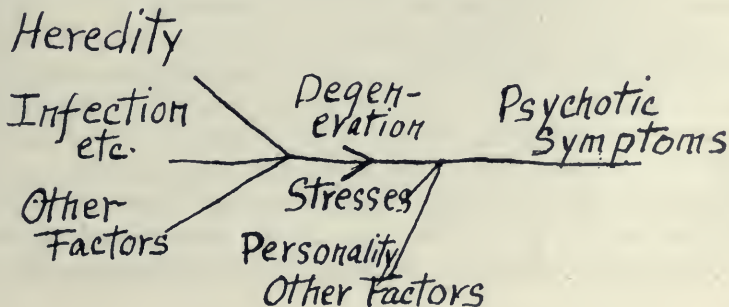
Heredity. Inheritance implies a structural basis and direct transmission in a certain percentage of cases of precox is beyond doubt.

Some maintain that an appearance of heredity is given by family mental constellations and in many family histories no evidence of the taint in antecedents is obtained. Again it might be the contention that the defect which is transmitted is merely a general tendency and not specific. Nevertheless there can be little doubt that the weight of the evidence at hand is in favor of the transmission of a specific defect.

Chronic course and deterioration. These postulates of Kraepelin can be true to the degree in which he has shown them to be only in case they have a basis in structure. That they apply in all cases has been denied but on evidence which is clearly insufficient.

The nature of the constitutional factor in dementia precox receives a plausible interpretation, if our reasoning be correct, when compared with the pathological process at work in the primary degenerations. In this manner we are enabled to see through the cloud of delusions, hallucinations, will disturbances and other mental symptoms and observe the workings of the underlying pathological process. As one of the group of primary degenerations the causeless origin and progression become clear as the result of a degeneration of structures concerned with some unitary physiological function. This alone is the essential process; mental symptoms are entirely secondary, may be absent in recognizable form, and vary in degree and form in accordance with many influences such as physical health, and mental constitution.

The situation in dementia precox probably has a very close analogy in the sequence of events in paresis. Here first, a combination of etiological factors, of which syphilis is one, work to produce the degeneration, and second, the mental deterioration, personality trends and other influences unite to cause the active mental reactions. So also with dementia precox wherein the sequence of events may be represented diagrammatically thus:



The function upon which destruction falls in precox can scarcely be determined. It probably has to do with the integration of sensory impulses and corresponds with the action of certain parts of the corpus striatum which regulate motor impulses. The essential mental disturbance is very slight, perhaps is undetectable, but may consist in the rather indefinite intrapsychic ataxia and loss of interest, as suggested by Kraepelin. Whatever its nature this affected function is so fundamental that sooner or later its loss is followed by a disintegration of the psychic adjusting mechanism, resulting in the more tangible symptoms. Such functions as observation and memory, however, are never affected in any degree, and therefore we can understand how almost perfectly lucid periods may occur for a short time even after many years of the most active mental disturbance.

The most promising path for investigating the affected function doubtless leads by way of some other degeneration like Huntington's chorea and otosclerosis (17). In these mental disturbances occur but are essentially different from those of precox, lacking, to mention but one feature, the characteristic "splitting".

Whether the mental disturbance in any other type of degeneration approaches that in precox is a question that for its answer probably depends on these others, the validity of the present group of precox and the specificity of heredity. Some obsessional, paranoid, and anxiety psychotic types may represent similar but distinct affections.

That anatomical changes should be slight in precox will readily be understood after a comparison with Huntington's chorea and paralysis agitans; for, as has been shown above, at higher levels structures pertaining to the various functions are probably not isolated and compact but scattered through the myriads of cells and fibers which make up the brain. Clinical signs of organic injury are lacking because the comparatively few structures which give rise to these escape destruction. The changes that occur are not unlikely beyond detection with present technical procedures.

We have now come to the questions of the specificity of heredity and the validity of the precox group. It is frequently stated that only the general tendency to mental disease is inherited and apparent instances of alternation of precox in successive generations with other affections such as manic-depressive psychosis, epilepsy and mental deficiency are given. Such dissimilar transmission is the exception, and in view of what has already been said of the value of symptoms may readily be explained as due to the faulty interpre-

tation of clinical pictures. A glance at the group of primary degenerations gives the impression that, despite familial peculiarities, each of the types is separate and distinct from all the others. These questions can only be definitely answered as to dementia precox by most careful genealogical studies wherein each case is considered in the light of its antecedents and descendants. Indeed, every mental case should be so studied; for an aunt or cousin may supply the diagnosis which the case itself withholds.

CONCLUSIONS

1. Some idea of the nature of dementia precox may be obtained by comparing it with other central nervous affections which appear to depend on a similar pathological process, for instance, the progressive degenerations.

2. There are a large number (some eighty, according to Bing) of different types of the progressive degenerations (abiotrophies of Gowers) and in their various forms they involve many diverse nervous functions of both higher and lower physiological levels.

3. It is noteworthy that many of these affections attack only structures concerned with one or two nervous functions and cease to advance after these structures have been destroyed.

4. Pathological changes are prone to be definite in those affections which involve the lower levels (*e.g.* the muscular atrophies) and obscure in those which are localized at higher levels (*e.g.* Huntington's chorea and paralysis agitans).

5. The anatomical findings, the evidence of inheritance and the chronic course and deterioration all go to indicate a structural basis for dementia precox.

6. In view of its causeless origin and subsequent progression, dementia precox is assumed to be a type of these progressive degenerations, and to have its pathological basis in the destruction of some unitary nervous function.

7. Since its localization is assumed to be at higher levels, the indefinite pathology and the absence of neurological signs can readily be understood.

8. The essential psychic disturbance is probably very slight perhaps consisting only of the phenomenon of "splitting". The more active symptoms are the consequence of a breakdown in the psychic adjusting mechanism.

Humboldt Bldg.

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TRANSLATIONS

EMOTION, MORALITY, AND BRAIN*

BY PROF. C. V. MONAKOW

ZÜRICH

There is nothing more difficult than to formulate a clear and universally acceptable definition of mental phenomena, particularly of those phenomena subjectively experienced which we call feeling and morality.

The study of feeling, especially of ethical behavior, was, until very recently, the exclusive province of the professional psychologist or the theologian, and was based largely upon theoretical (historical or poetical) considerations, and upon self observation. Feeling and conduct were looked upon as essentially artificial constructions of the inner life as conceived by the psychologist himself.†

Now, however, physiologists and biologists, psychiatrists and neurologists, even jurists and teachers have entered the field and have made intelligent study of mental phenomena including ethical conduct. Consequently, the professional psychologist has had to compete scientifically with the first group at any rate, the biologists and physiologists, inasmuch as these have taken as material for their investigations and experimentation all living creatures, all humanity; together with the various aspects of every day existence, and the gradual growth of feeling and emotion under normal and abnormal conditions. Furthermore, psychology has now become in no inconsiderable degree a truly biophysiological science. It makes use of experimental, clinical and historical as well as of evolutionary and morphological methods. In my opinion that man, who will in some future day combine all the findings arrived at by these methods, utilize these investigations and delve most deeply into all these theories, will uncover a rich field of material yielding most fruitful results, provided he himself possesses also a profound practical understanding of human experiences.

In the biophysiological field the most important factor will be, in

* Authorized translation by Gertrude Barnes, A.B., and Smith Ely Jelliffe, M.D., of the authors *Gefühl, Gesittung und Gehirn*.

† In so far as the matter was not a matter related to practical life.

the first place, a correct starting point of inquiry; secondly, as clear, sharp a definition of the conception as possible; thirdly, a recognition that the experimental physiological method must wait upon the pure subjective analysis, at least from a certain point up. Similarly, the pure psychological method must pause before the biochemical and biophysical processes in the body.

I, myself, have for a considerable period widely studied the works of such schools of psychological literature as Spinoza, Kant Schopenhauer, A. Comte, H. Spencer, Wundt, etc., principally for my own information; reading *The World of Perception and Orientation*, and *The World of Feeling*, in order to grasp the subjects from the point of view of their genesis in the bioembryological aspect. These studies were begun by Schopenhauer and Von Bichat, continued by later biologists (Darwin, Haeckel, Forel, etc.) and particularly advanced in recent years by R. Semon,* with reference to mnemonic sensations, all of whom have chosen this field for very detailed research. My own studies I sought to base upon a still broader foundation, bringing in the added factors of anatomy and physiological pathology, since I included in my cycle of observations brain pathology (Lokalisationslehre) and the neurologic in its bearing on psychiatry, taking in as well pathological embryology (Idiotie).

In the domain of the emotional life I do not intend to bring forward new facts in my presentation of the subject. I would, however, include some new viewpoints on the principles of the emotional life (a more lively discussion of which has been provoked since the appearance of the writings of Von Breuer and Freud) and try to make somewhat clearer several normal and abnormal phenomena—particularly those which bear upon the problem of morality.

Many may object to the title of my report. The subjects "Morals and Brain" may seem, at least at first glance, to be separated by an unbridgeable chasm. To describe the feelings anatomically sounds like veritable nonsense. Still, diverse as these conceptions appear, there is nevertheless a broad connecting bond between them, *i.e.*, that of morphological-biological and historical development.

To create an instrument of such perfection as the human brain it must have taken thousands of years of endeavor on the part of the "World-will" (which for Schopenhauer is Kant's "thing-in-itself") and infinite effort, to attain the performances ascribed to

* Die Mneme. Die mnemischen Empfindungen. Leipzig, 1909. English translation of Die Mneme by Simon available. London, 1922. See Jelliffe, S. E. Richard Semon and his Work. JOUR. NERV. AND MENT. DIS., June, 1923.

that organ, the precision and delicacy of the organization on the mental side being nearly equalled by the morphological and structural development.

What are emotion, morals, and what sensation, perception, and orientation? Everyone is thoroughly familiar with these terms, they are commonly employed. But no one can give a universally acceptable definition of them, setting forth with certainty the real nature of these forces.

Concerning the subjective content of the emotions (in the ego) our knowledge comes almost exclusively from introspection. But we could not begin to analyze and record our emotions were it not that along with them there went the parallel development of language, gesture and facial play. It is these modes of expression that offer us subjective standards for measurement and comparison. But speech, like symbolism in general, is a social mode of expression resting upon mutual understanding between individuals. It is a coin for social usage, bearing a definite and recognized exchange value. This "coin" has gained a definite current value through long periods of life in common and of participation in mutual experiences in the same world of feeling and instinct, and through the conditions derived from these experiences (apperception of Steinthal). We gain certain and accurate knowledge of our own feelings, at least of our finer feelings, only when we have refined them and given them precision by contact with our fellow men, in whom we presuppose similar experiences.

This, in the first place, occurs through the medium of the symbolic, namely, articulate speech, gestures and other media; in the primitive stage also through inarticulate sounds. Social feeling can obviously develop only through the direct medium of human intercourse, and primitive modes of expression (inarticulate sounds, facial play, pantomime) are those which have paved the way to articulate speech. Through the medium of the spoken word first, then through the actions and conduct springing from the feelings that underlie the social impulses we have been able to give definite objective body and form to the emotions and make a more accurate study of them.

The vocabulary of daily life, the dictionary, so to speak, of feeling, by the measure and store of its wealth indicates the depth of our understanding and orientation in the sphere of feeling. This orientation is of the very first importance for mutual understanding in social life. Our knowledge of the feelings will reach a higher development only as we make a minute and concentrated study of the

more subtle, artistic, religious and philosophical facts in individual cases. With this the spoken word, however, cannot always keep pace. Words do not always express exactly that which is within us, and this causes innumerable misunderstandings and misconceptions among people. These elements in our constantly increasing individual register of feelings, corresponding, that is to say, to our apperceptions, to which we cannot give expression in ordinary words, find outlets through other media which, though rich in content, often have not much significance for the general mass of people since not every one possesses understanding of these media, *i.e.*, music, the plastic arts, religious symbolism, etc. Through this mode of expression, that so powerfully influences our modern life, a narrow circle is drawn around the higher feelings and common interests of a race, even of races. This circle is of enormous significance in evolving and deepening the total sphere of emotion and morals (*Gefühlsleben und Gesittung*) notwithstanding the great liberty granted to individual interpretation in art.

1. For those who seek for truly scientific knowledge, particularly for biologists, it will not suffice to note what the every-day common experiences of life disclose. Nor for these will even sharpened self-analysis in the realms of feeling of the individual as observed by the professional psychologist, be sufficient. The biologist must probe more deeply into the problems of life.

2. The professional psychologists proceed in their efforts to study the human soul at closer range and by "autoanalytic" means about as follows: They sort and grade the feelings, in the first place following their own inner experiences. But they employ the customary and rather crude vocabulary of every-day life, and depend upon their own language sense for dissecting and classifying the feelings—a procedure which in the last analysis, leaves the whole matter to their own taste and judgment.

3. What we need, however, particularly at this time, is not so much a keener sharpening of our feelings and the provision of terms and denotations, for the more subtly differentiated feelings of the individual (*Gefühlsregister*), as a careful study, first of all, from the biological standpoint of the primitive feelings and instincts of common experience in their influence upon daily life and conduct. In the next place, we need to study the awakening and coming into existence of the primitive feelings and instincts in the phylogenetic and ontogenetic embryo so far as these find expression through particular acts; then follow them carefully through their further evolution and upward development to the higher forms, straight up to the develop-

ment of social feelings and morality; as was attempted (to be sure in an elementary and schematic form) by Darwin and his successors (*The Struggle for Existence and the Preservation of the Species*). We cannot, however, stop at this point. We must extend our studies to include, of course under the constant control of biologically trained self-observation, objective and biological observations of our fellow beings, in the most varied phases of their lives, under normal and abnormal conditions, through confessions, emotional reactions, etc.,—however knotty and at first glance confusing, such a study may occasionally appear.

4. A forceful impetus to unravel the secrets in which the human feelings, particularly the unconscious with their many-sided collisions, their latent accentuations and subaccentuations were veiled, has been given in the past ten years by a small group of neurologists and psychiatrists, who have made studies both upon normal subjects and a number of neurotics (Breuer, Freud, Bleuler, Jung, Adler, etc.), after the professional psychologist had proven himself to be somewhat sterile on this subject. But even before these men, many not unimportant observations in the study of suggestion and hypnotism had been made by Liebault, Forel, Bernheim, Stoll, etc. As a permanent result of these studies it was found that experiences which powerfully affect the inner emotional life, especially those of very early childhood, have a permanent influence upon the subsequent course of the feelings as well as upon the character and conduct of the adult, even when these experiences are removed from spontaneous "ekphorische" reproduction (memory), moreover, in experiences thus colored by emotion, which have passed over into a seemingly harmless latent condition (Komplexe of Bleuler) there may be found an important source of information for later pathological conditions of the mind.

The particularly important and new light shed by these investigations that were conducted with inexhaustible patience and by methods not only complicated, but sometimes even open to objections, brought the following results: (a) That there exists in the emotion laden "engramme" of the individual, even though it be inactive during the period of development, a potential energy, an exceedingly active latent stimulation-index (mnemonic source of stimulation), reaching deep down into the pathological, of which condition the individual himself often has no real consciousness. (b) That such a latent stimulation complex (Reizcomplex) may even after many years be brought to an active, functioning condition, united with the former somatic accompanying manifestations and violent mental emotion;

when perhaps through detours, through association tests, through appropriate symbols, through seemingly harmless allusions and suggestions, the approach to these obscurities in a single favorable moment may be disclosed (Freud, Bleuler, etc.). (c) And that the life course of the feelings become particularly susceptible to attacks and influences of all kinds only when regarded as slowly and gradually brought into being and form. In particular do those sexual strivings of latent development and seeking early a satisfactory outlet offer, if they are offended, a favorable soil for bringing into being the so-called emotion-laden "complexes." The above mentioned psycho-analytic method, in the broader sense * in the study of neurotics, is undoubtedly important and almost indispensable; although in the hands of the uncritical it may, and even has led into wrong tracks. At all events the testing process ought to be fundamentally improved and a more rigid control instituted. Under any circumstances the results from this method ought to be given value only with the greatest caution.

How shall one, however, in the study of the feelings remain in contact with morphological and even with pathological anatomy, where we have to do with special relations and lifeless matter, whereas the feelings as noted by Kant and Schopenhauer transcend space and in a measure even time? Now we must mark at this point that that world of sensation and perception which is most intimately united with feeling and instinct, and also the actions that manifest the subjective causality of physiological productivity that the analysis of it without the knowledge of the morphological basis can lead to no satisfactory goal.

Many years of association with localization in the central nervous system, particularly in the cerebrum and especially with the clinical manifestations that are the consequences (the course of the reaction as related to temporary functional disturbances), through local attacks upon the brain substance which I have designated as "diaschisis," brought home to me the following thought. Running parallel to the innumerable phases and compartments more or less sharply differentiated with regard to the periodic and rhythmic structure in the morphological development and in the more delicately sensitized fabric of the central nervous system (myelinisation, histotectonic differentiation of the various "systems" histogenesis of the

* Also the studies by Dubois through unrestrained conversation. P. duboise. The Psychic Treatment of Nervous Disorders. Translated by Smith Ely Jelliffe and Wm. A. White.

individual elements, etc.) also in the sphere of the evolution of the nervous functions, and lastly of the psyche, there are corresponding experience sequels (*Engrammeschübe*) which moment by moment articulate, fasten and hold to one another. Further, I assumed that by the side of this successive construction of the function there occurs a corresponding decomposition (produced not only through pathological processes, the action of chemicals, but also by mechanical attacks, interruption of continuity in the network). Clinical empiricism roused me to go further along such thought paths and to apply the methods of observation indicated above to the world of feeling and to the world of morals. For offenses in the realm of feeling may possibly have their material (partly toxic, fermentatively active) components, and a particularly strong component in the case of individuals with a predisposition to neurosis. Through hyperfunction, united with innumerable autotoxic, also histopathological factors, the nerve substance could experience similarly destructive effects, even if these be essentially different in relation to the subtle points of attack of the noxe, as the world of perception and movement has through coarser more sharply localized pathological anatomical processes (*Herde*), that is to say, in the sense of the degeneration of function; in the former insults, however, less in the sense of a degeneration of "orientation" than of a degeneration of the world of feeling and morals.

I, myself, recognize that I am stepping here upon exceedingly subtle ground, which is trod daily by both the "bidden and unbidden" and upon which one is but too likely to stumble. Nevertheless, I did not feel myself tempted to dodge the difficulties which I, too, should have to encounter. What particularly attracted me in this whole question was first, the importance of a continuous building up and breaking down of functional activity in the domain of the emotional life also; secondly, the dependence of the normal life course of feeling upon the character of the blood and the fluids (osmotic pressure, supply of ferments, etc.); thirdly, the study of shock, diaschisis and further chronogenic localization in the central nervous system in the whole animal world. But these matters have been thoroughly discussed in our circle.

(1) The first question which thrusts itself upon us as we step into the field of biological psychology, is the following familiar one. Does there exist in animals a susceptibility to stimulation in the nerve texture (and how far down in the scale of animal existence does it extend) which exactly corresponds to what in human life we call "subjective feeling," and at which phase do these gradings of emotion

(and in what degree and form) begin to germinate what we call conscious feeling?

The new-born child could serve as the starting point of our study. The new-born undoubtedly gives evidence of both feeling and instinct (pain, uneasiness, need of nourishment). One cannot, however, speak of definite feeling in the children first born. Not until near the middle or end of the first year of life can this be ascertained to exist with any degree of certainty; indeed in the more accurate definition of full consciousness the manifestations come even later than the end of the first year, and still later comes self-consciousness connected as that is with the ability or aptitude to awaken or stimulate definite memories. Full consciousness can, however, be developed only by gradual stages.

Clear manifestations of the will and essential characteristics of conduct are at all events older than the "conscious" concepts. The latter are more probably the products of the former or of attending or concomitant circumstances and can in no way be considered their source or mainspring. In point of fact we find even among adults that it is the more or less finally developed inclinations and instincts that set in motion most acts of life, even complicated ones. And only an entirely definite form of the corresponding mysterious physiological productivity is reflected in us in such a manner that we accept subjectively that light, that sharp penetrating flash, which we designate as consciousness—and even this form is reflected only in circumscribed areas. By far most of that which goes on in our psyche—daily life teaches it to us—and most neurologists know it—reaches the threshold of our consciousness only imperfectly and in shadowlike manner; nevertheless it does not remain entirely inert and is never entirely lost either in the evolution of our conduct or the manifestation of the senses.

The links of each chain of behavior plus the accompanying feelings and instincts are locked in the subconscious or unconscious (unconscious propriceptive Sensibilität). They unfold themselves further in the brain through latent laws still unknown to us, while we subjectively have the silent conviction that that which we do and do not do is the immediate work of our conscious mind. Upon these subjects Schopenhauer has expressed himself clearly, and in my opinion with unbiased mind, in his work *The World as Will and Idea*, as Spinoza had done before him.

Now to return to the subject of animals. Only in their feelings which resemble our own, taken in connection with stimulants which also engender in us subjective feeling of a clearly defined nature, can

we make inferences as to their inner experiences, from analogy. In the finer interpretations of behavior there remains to be sure much that is uncertain. We possess beside good grounds for assuming that animals, dogs for instance, have not only those feelings that manifest themselves in immediate response to extero- or interoceptive stimulation, but out of these feelings there are built up in them "engrammes" of a degree of complication relative to their level of development (latent stages of recently received stimulation); these "engrammes" under modified circumstances in which only one and in fact generally the leading "mnemische" component of the primitive urge or stimulation is received, arrive anew at "Ekphorie" and this in a form which corresponds to an attenuated condition of the former original feeling.

On this point direct corroboration is given by the investigations of Pawlow (conditioned reflexes). In these experiments the secretions of various organs were tested by the employment of fistulae for stomach and saliva and even by the use of stimuli of various kinds. A dog that had been trained to take his food simultaneously with the sounding of certain musical tones following at regular intervals, showed an increased gastric juice and saliva secretion at a sign of awakening desire for food, not only when he had a piece of meat in his jaw or saw it, but also without the presence of meat as soon as the musical tone sounded. (Observed also by O. Kalisher.) In the case of such an animal there suffices for the repetition of this act only a single, not necessarily the most important, element of the stimuli that caused the flow of saliva, in order to bring about again a secretion of the saliva.

This factor is unquestionably of a psychic nature. The so-called mnemonic stimulation operates here, which compel the visceral nerves to act reflexly, just as in the first place they responded extroceptively through the medium of direct stimulation. By means of these experiments with musical tones we obtain objective demonstration of the course of development of many feelings.

These and many other experiments of O. Kalisher justify us, in concluding that in human beings as in animals experiences that are charged with definite emotional-value (*Affectwert*) are further worked over secretly in the psychic life (grouped according to their value, and subject to the law of causality), thus showing, in other words, that they pass over into a complicated latent state, and furthermore that such stimulation forms are of a very active character and that the "Engrammes" under consideration can be brought to memory by simple symbols.

Individual observations by dog fanciers attest to this fact. In some breeds of dogs (hunting dogs) certain fixed emotional stimuli acquired either through experience or feeling, through sign or symbol which play an important part in hunting (gun-shot, sounds of game in the woods) live and are revived in the animal in latent form through many generations (and persisting latently, are passed on in latent form to the germ and become active motivating forces, R. Semon). Under proper stimulation they can attain to "Ekphorie," even if no training answering to the same stimulus has ever been given to the animal in question. Exner tells us about a hunting dog which from the time of his birth had been kept in a cage and which, when taken therefrom to the hunt for the first time, sprang immediately and nimbly upon the quarry at the sound of the first shot.

All this points to the fact that in the higher mammals the so-called mnemonic emotional "Engrammes" can be reproduced through signs and symbols as in human beings, but only within a limited range.

There arises, however, this important question: To what level in the descending evolutionary scale of animal existence do feelings and instincts resembling our own love, greed, passion, anger still continue to exist? Upon which rung in the evolutionary ladder do we encounter the phylogenetic level at which, in some demonstrable form they begin to exist, and to what nerve structure are they related?

If we proceed from the now accepted hypothesis that in its beginning everything is of simple nature, and that in the morphological differentiation of organs, particularly the central nervous system, on the one side, and the wealth of physiological research on the other, there exists an active, causal connection and interdependence, then the following considerations force themselves upon our attention.

The most elementary impulses of life are the primitive instincts, hunger and love. They are the most elemental factors of life and are known as *The Struggle for Self-Preservation* and *The Struggle for the Preservation of the Species*.

As a third moment Darwin names "Natural selection." More recent writers (Loeb) would like to place the instincts at the lowest point in the scale, and put in their place the "chemotaxic" moment in order to exclude every transcendental and anthropomorphic aspect. In my opinion we cannot dispense with either instincts, the instinct of self-preservation and the preservation of the species, if we set out from the biological standpoint. But, of course, it still remains undetermined in which form the inner illumination or enlightenment of feelings and instincts (hunger, for instance) can, in certain

animals, be likened to the process in human beings. The reduction of both primitive instincts to one and the substitution of the expression "primitive-instinct" by the expression "Lust" or "Will" (Schopenhauer), does not make our methods of observation more profound in my judgment. On the contrary, I consider it more fruitful if within the world of impulse or inclination we assume the number of single forms to be rather more numerous than is commonly the case, and within these undertake still wider and sharper divisions (into separate principal groups).

In view of earlier observations made by me elsewhere* on the workings of the primitive nervous system or—in the case of individual animals—of the living protoplasm, I incline toward assuming four basic types of instincts that merge into one another, upon which all later active and latent feelings, emotions and their derived qualities are built up and from which they evolve onward and upward to the point of character:

(a) Emotion engendered in connection with the search for food and with the other functions of prime importance in life as well as emotion inaugurating impulses of defense against injury (such as taking up or receiving nourishing and strengthening substances, expulsion of chemical substances dangerous to life, fusion or division, that is, separation of the elements of stimulation).

(b) Sexuality (libido protection and care of posterity—the preservation of the species).

(c) The foundations of emotion connected with creating and protecting collections of creatures of like nature (herds, squads, crowds, etc.). In other words, the basic elements that underlie the social feelings, the "herd-instinct," and finally on the highest level.

(d) The seeds of warm emotions for creatures of other species as well as the germ reverence for all creation (symbiosis, plasticity, accessibility of the animal for training, etc.). The results of training an animal in the direction of a higher level of life, or fitting it to the intents and purposes of such, I should not like to give out in the sense of "self-preservation" without further observation and thought. "Feelings" of this character gradually lead up to the most primitive form of culture (rudiments of culture).

* Localization in Cerebrum.

(To be continued)

SOCIETY PROCEEDINGS

NEW YORK NEUROLOGICAL SOCIETY

THE FOUR HUNDRED AND FOURTH MONTHLY MEETING, APRIL 3,
1923, THE PRESIDENT, DR. E. G. ZABRISKIE, IN THE CHAIR

MEMORIAL OF WILLIAM M. LESZYNSKY, A.B., M.D.
J. RALPH JACOBY, M.D.

We greatly regret to announce the death of Dr. William M. Leszynsky, for many years intimately associated with the work of the Society, one of its former presidents, and an earnest and untiring coöperator in its various activities. He was born at Newport, Rhode Island, on June 16, 1859. After leaving school he took the scientific course at the College of the City of New York, where he received the degree of Bachelor of Arts. In 1876, he entered the University of New York Medical School, and received his degree of Doctor of Medicine in 1879.

At the time of his death, March 3, 1923, he was attending neurologist to the Lebanon Hospital and the Manhattan State Hospital, consulting neurologist to Christ Hospital (Jersey City), Harlem Hospital, and the People's Hospital. He was for many years consulting neurologist to the Manhattan Eye and Ear Hospital and the Demilt Dispensary, and lecturer on mental and nervous diseases at the New York Post Graduate Medical School.

Dr. Leszynsky was a member of the New York Neurological Society, the New York Academy of Medicine, American Medical Association, American Neurological Association, Medical Society of the Greater City of New York, Society of Medical Jurisprudence, Metropolitan Medical Society, New York Physicians' Association, New York Medical Union, Harlem Medical Association, Manhattan Medical Society, Medical Society of the County of New York, New York Medico-Surgical Society, Physicians' Home, Society of the Alumni of Lebanon Hospital, Association for Research, National Committee for Mental Hygiene, Thomas Hunter Association of Grammar School No. 35, etc.

Dr. Leszynsky was a prolific writer and contributed many

scientific articles to medical literature.¹ His attainments in the field of neurology were broadly recognized. Here, in New York City, his endeavors were most appreciated, because we were able, as his associates, to come more closely in contact with his personality and to know the human side of him. In our own Society we came to know him not only as a man of precise knowledge and high scientific attainments, but also as one so modest and retiring that the very qualities that made him preëminent in his profession sank into the background of his geniality and personal charm.

The New York Neurological Society has passed a resolution that a copy of this memorial be sent to his widow, with expressions of sympathy, and that copies also be sent to the *JOURNAL OF NERVOUS AND MENTAL DISEASE*, the *Archives of Neurology and Psychiatry*, and the *New York Medical Journal and Medical Record*.

¹ The following is a list of writings of Dr. Leszynsky:

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LUMBAR ARTHRITIS AS A CAUSE OF SCIATICA

DR. P. WILLIAM NATHAN (By Invitation)

(Author's abstract.) The symptoms of sciatica as usually described cannot be correlated with an actual lesion of the nerve trunk or the sacral plexa. The neurological symptoms are evidently radicular and are more or less exactly similar to those that are known to accompany lesions of the vertebræ and the cauda equina. The spasm of the muscles, the deviation of the spine and the fact that the symptoms are aggravated by movement and alleviated by rest, strongly suggest that the lesion is of an inflammatory nature involving the lumbar vertebræ.

In our endeavor to confirm this *a priori* conclusion, 140 consecutive cases of so-called sciatica were examined radiographically at the Mount Sinai Hospital and in private practice. Of these, 126 showed

more or less extensive arthritic changes in the lumbar vertebræ.

It may, therefore, be concluded that in a large majority of cases with sciatic syndrome, the cause is to be sought in inflammatory vertebral lesions. It is, however, necessary and at times difficult, to exclude tuberculous and malignant diseases in this region.

Discussion: Dr. C. C. Beling said: In what position were the radiographs taken, upright, or lying down?

Dr. Nathan said they were taken lying down.

Dr. Beling continued: Dr. Nathan has presented a group of cases of sciatica due to vertebral disease, but some cases are due to muscular changes. In 1904 Gowers stated that some of the cases of sciatica were due to inflammatory conditions of the white fibrous tissue of the muscles, and thought that the spindle cells of the muscles and tendons were affected. When we speak of pain on the outer aspect of the thighs it is due to lack of differentiation of the location of the pain. Sometimes affections of the external lateral cutaneous nerve are mistaken for sciatica. Sciatica is simply a symptom complex that may be due to many conditions, and one of the commonest causes is doubtless neuromuscular fibrositis.

Dr. B. Rosenbluth said: I have been very much interested in this paper. I have seen a great many cases at the hospitals with which I am connected, and also in my office. One thing which we have always insisted upon is the radiographic examination of the hip and spine. Although we have had a great many cases radiographed, the report of the X-ray man have always been negative; in fact, I can hardly recall a case in which the vertebræ have been shown to be actually involved. Occasionally a report says that we are dealing with a sacroiliac dislocation, but not one case where the vertebræ are actually involved. The pictures shown by Dr. Nathan indicate very definitely the vertebral involvement. From the clinical point of view one sees cases of so-called sciatica that come in with a definite scoliosis, and that, with a comparatively short or light treatment, are relieved entirely of the pain and at the same time get complete relief of the scoliosis. That has been seen innumerable times. The patients seem to suffer from some kind of muscular contracture that causes the scoliosis. That is why I also asked in what position the X-rays were taken. I have seen definite scoliosis where there was an appreciable difference in the measurements of the hip. The orthopedic condition disappeared after an epidural injection. One is puzzled to know why the condition which apparently is one of vertebral involvement can be affected by an epidural injection.

Dr. Nathan (closing) said: I cannot say much in regard to the first speaker's remarks. I have never been able, in the examination of a large number of patients, to demonstrate a condition which resembles the so-called fibrositis as it has been described, at all. Patients often complain of pain at the origin of the muscles, and myositis is not an unusual condition, but one is not able to demonstrate that it acts in such a universal manner as has been claimed.

Dr. Rosenbluth's viewpoint regarding recovery from sciatica is well taken. There are a considerable number of cases that come in

as sciatica, having scoliosis, etc., which clear up after epidural injection. This is perfectly true. Lumbar spondyloarthritis, like any other joint condition, may be mild or come on acutely and disappear with or without treatment. In some, the scoliosis is due simply to muscle spasm which disappears with the subsidence of the inflammation; in others, it is due to bony involvement and destruction of the tissues; but even these, when taken in hand early, are very amenable to orthopedic treatment.

With a well-equipped X-ray laboratory, and the services of a good radiographer, one may detect changes in the vertebræ in many cases although some are not very marked. In only 14 out of 140 cases were we unable to detect any vertebral change. The point I wish to bring out is that the syndrome sciatica cannot be brought into correlation with a condition in the sciatic trunk. The symptoms as they are described and as they are encountered in practice are characteristic of root irritation and, as can be demonstrated, this root irritation is most often induced by lumbar or more extensive spondyloarthritis due to nontuberculous infection. However, as malignant and other diseases in this region induce similar symptoms these must be carefully excluded.

VERONAL INTOXICATION

Dr. Irving J. Sands reported a series of fifteen cases illustrating the various manifestations of acute and chronic veronal poisoning. The drug primarily causes dilatation of the small vessels and capillaries, causing a slowing of the circulation, reduction in oxidation, in heat dissipation, and in lowering of the temperature. The slowing of the cerebral circulation and the reduction in the rate of oxygen and carbon dioxide exchange in the cerebral capillaries are responsible for the hypnotic effect of the drug. In small physiological doses, about 90 per cent of the drug is recoverable from the urine; in larger and in toxic doses, only about 50 per cent is found in the urine, the remainder being stored in the tissues of the body.

Acute veronal intoxication results from the inhibition of a large dose of the drug, usually over 50 grains. The individual is comatose; the temperature is subnormal or moderately elevated; the pulse is slow or rapid; and the respiration may be lowered or increased. The face is flushed, lips and finger tips cyanosed, and extremities cold and clammy. The blood pressure is low. The urine contains albumin, granular and epithelial casts, and veronal. The tongue is heavily coated and breath is foul. There may be incontinence of urine and feces. The superficial as well as the deep reflexes are diminished, and in the more serious cases, may be absent. The pupils may not react to light or accommodation. Spontaneous contraction and dilatation of the pupils are regarded by some observers as pathognomonic of veronal intoxication. On regaining consciousness, the patient shows a thick, drawling, indistinct speech resembling the speech of the paretic. There may be diplopia; nystagmus is common. Delirium may supervene. Death usually results from bronchopneumonia. At postmortem, there are seen general hyperemia of all organs, cardiac dilatation, pulmonary edema and

bronchopneumonia, degeneration of the convoluted tubules of the kidneys, and fatty degeneration of the liver. Excepting the presence of hyperemia, the brain is found to be normal. Veronal is recoverable from the various organs. Recovery from 125 grain doses is frequently reported in the literature; larger doses usually prove fatal.

Chronic veronal intoxication results from repeated small doses of the drug. The patient is somewhat cyanosed, and there may be erythematous skin lesions. The station and gait are ataxic, and there is general dyssynergia. Speech is drawling and indistinct. Breath is foul, tongue coated and constipation is present. The temperature may be found to be subnormal, the blood pressure lowered and pulse slowed. Mentally there is an irritable, suspicious attitude and manner, emotional instability, defect in attention and poor retention. Memory, especially for recent events, is poor. Judgment is defective, and there is poor insight into the condition.

These cases must be differentiated from paresis, epidemic encephalitis, uremia, and possibly cerebral neoplasm.

Dr. Sands called attention to the personality of the individuals suffering from veronal poisoning. His experience led him to conclude that the vast majority of cases suffering from acute veronal intoxication belonged to the manic-depressive group of people, while those of the chronic veronal intoxication group had the personality of the constitutional psychic inferior group of individuals. Therefore one often finds that these patients take the drug with suicidal intent. Furthermore, the chronic intoxication cases take the drug as a flight from reality whenever facing any situation entailing considerable painful emotional feeling. Such people often take alcohol and many of the chronic veronal cases are alcoholics. Several of these cases admitted drug addiction as well.

The limitation of the sale of veronal on physicians' prescriptions only, and the use of the term of diethylbarbituric acid rather than the trade names of veronal and barbital would limit materially the number of poisoning cases.

Discussion: Dr. S. R. Leahy said: I think that Dr. Sands has covered the ground very well and there is little more to be said. I should like to disagree in some minor details. I do not think the coma is characteristic of this condition alone. I think all drug cases are somewhat similar in that respect; also, it is not always possible to distinguish the coma from that of an organic state. These people have often been users of other drugs, bromides, luminal, etc. I have seen one case of a man with delusions of jealousy against his wife and tremendous excitement, as the result of small doses. Every effort was made to keep the man from toxic symptoms. We may be dealing with a psychosis mixed with the drug intoxication but the other features were not characteristic. In this case there was a history, ten years previously, of depression which lasted for several months. With the clearing up of the intoxication symptoms, she went into a full fledged typical manic attack and had to be committed. These cases of veronal intoxication are very often diagnosed as general paresis. The ataxic gait and reduction of the knee jerks

suggest general paresis. In any case it is necessary to work out the serology of the case. This will help to clear up the diagnosis. I am in hearty agreement with what Dr. Sands has said in regard to restricting the sale of this drug without prescription.

Dr. W. J. Dougherty said: In regard to limiting the sale of veronal, as suggested by Dr. Leahy, the Board of Health recently added to the Sanitary Code a clause prohibiting the sale of veronal without a physician's prescription. Since that time the number of cases of veronal poisoning coming to Bellevue Hospital has been very small. Prior to the enactment of this restrictive clause we always had cases of veronal intoxication on the wards of the alcoholic and psychopathic service of Bellevue, but now it is the exception to encounter cases of this type. We had one recently, the first in some weeks. This is a man who formerly spent most of his time at Bellevue, literally going out one door and in another. I do not believe that veronal addiction is to be regarded as an expression of manic-depressive psychosis as we seldom find manic depressives who are veronal addicts, although some depressed cases resort to the drug to terminate their existence. There is no doubt but that veronal addicts are, in most instances, cases of constitutional psychopathic inferiority, and that such individuals feel incapable of facing the ordinary vicissitudes of life, and hence have recourse to veronal in an effort to efface themselves from the scene for varying periods of time. They may be regarded as potential suicides, both desiring to escape what seems to them the painful experiences of life: the suicide permanently; the addict usually merely for the time being. Confirmation of this theory is to be found in the number of veronal addicts who actually attempt suicide.

I have seen only one case of fatal veronal poisoning. This was a man who was found unconscious on the street with narcotics in his possession and who was supposed to be suffering from morphine poisoning. His respirations were, however, too rapid for morphinism. The pulse was fairly rapid; the pupils were contracted but not to the extreme degree we find in opium poisoning. He died half an hour after his admission to the hospital, and shortly before his death his respirations were but four a minute. This case did not exhibit the muscular twitchings that Dr. Sands has spoken of as occurring in fatal cases of veronal poisoning. The case went to autopsy and the laboratory findings showed that veronal was the cause of death.

Dr. B. Onuf said: I have been very much interested in the discussion and particularly in regard to the relation of veronal addiction to manic-depressive states. Dr. Sands finds the acute veronal poisonings mostly in manic-depressives, the chronic ones mostly in cases of emotional instability. I do not know that we can make a sharp distinction between emotional instability and the manic-depressive psychoses. I think the manic-depressive temperament which is at the bottom of the latter, has many varieties. Some of its possessors are predominantly depressives, others prevalently manics—both often within physiological limits. In still others there is an intimate mixture of alternation of these opposite trends and it is the latter who

show particularly what can be termed emotional instability. In my writings on the manic-depressive temperament I have put down as one of the characteristics of this temperament or constitution that those who possess it are very apt to become addicts to habit forming drugs, sometimes, as in the case of insomnia, for their narcotic and soothing effects; sometimes, as in the case of brain fag, for their exciting and efficiency increasing effects.

Where the soothing and soporific effect is desired, veronal is often preferred for its milder action to other narcotic or hypnotic drugs. I think this inclination to take habit producing drugs is illustrated by what we hear of the Hollywood conditions. This class of people can be described as being endowed mostly with manic-depressive temperaments. That is why drug addiction is so prevalent in that colony.

Dr. E. G. Zabriskie said: I am reminded of a general remark about conditions in China. When the authorities made a strong campaign against opium, the consumption of gin increased 1000 per cent. If we limit the selling of veronal, what is the addict going to do next? We should consider these people as definitely of a psychopathic constitution and attempt to guide them rather than merely restrict the sale of any particular drug.

Dr. Sands (closing) said: I have cases illustrating the points to which Dr. Leahy referred. Formerly I invariably mistook these cases for paretics; I recall several patients whom I considered as subjects for the state hospitals, only to change my mind as soon as they disposed of the drug. In regard to Dr. Dougherty's statement, I came to the conclusion that these acute cases really did not want to die; what they really wanted was to get rid of their unhappy personality. In studying the entire "longitudinal section" of their life's reaction, it must be admitted that the acute veronal intoxication cases are really manic-depressive individuals, while the chronic veronal cases are examples of the emotionally unstable group of the constitutional psychopathic inferiority group of individuals. These patients have shown other peculiarities in conduct besides taking veronal.

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY
MEETING, APRIL 19, 1923, F. K. HALLOCK, M.D., PRESIDENT, IN
THE CHAIR

THE SPINAL FLUID OF ENCEPHALITIS LETHARGICA

Dr. J. B. Ayer and Miss J. E. Cockrill read this paper. Judging by the frequency with which the diagnosis of encephalitis has recently been considered in connection with differential diagnosis a recrudescence of this disease seems imminent. In that in our experience the spinal fluid findings have proved of considerable value, and in that our findings are similar to those published previously from our clinic by Foster (J. A. M. A., 77:365, 1921) it seems best to give them at the present time.

During the past year we have examined fluids from 23 patients with encephalitis, the diagnosis resting upon the clinical course of the disease and in two instances checked by necropsy. The findings are shown in the accompanying table:

Case No.	Age	Time since Onset	Pressure in mm. H ₂ O	Cells 1 c.mm.	Globulin (Ross-Jones)	Total Protein mgs. 100 c.c.	Colloidal Gold	Sugar* per cent	Wassermann
1	24	3 days	185	0	Present	33.	0000000000	.0576	Negative
2	74	Few days	216	115	None	47.	0001221000	.0727	Negative
3	33	1 week	168	15	Slight	48.	0000000000	.0917	Negative
4	16	1½ weeks	140	4	None	29.	0000000000	.0928	Negative
5	30	2 weeks	150	39	Slight	67.	0000000000	.0689	Negative
		2½ weeks	100	12	None	58.	0000000000	.0800	Negative
6	20	2½ weeks	60	0	None	36.	0000000000	.0701	Negative
		3 weeks	120	2	Slight	52.	0000000000	.0700	Negative
7	27	2½ weeks	100	1	Slight	60.	1333320000	.0730	Negative
8	20	3 weeks	180	4	Present	50.	0000000000	.0720	Negative
9	43	3 weeks	150	4	Present	47.	0000000000	.0730	Negative
10	35	3 weeks	130	7	None	37.	0000000000	.0980	Negative
11	51	3 weeks	130	2	None	33.	0000000000	.0740	Negative
12	30	3 weeks	175	4	Present	67.	0000000000	.103	Negative
13	38	3 weeks	145	1	None	35.	0000000000	.0719	Negative
14	36	3½ weeks	145	34	None	41.	0000000000	.0724	Negative
15	28	4 weeks	50	34	Present	54.	0000000000	.0707	Negative
16	26	4 weeks	115	32	Present	51.	0000000000	.0724	Negative
17	28	5 weeks	140	7	Present	48.	0000000000	.0645	Negative
18	36	2 months	150	2	None	33.	0000000000	.0645	Negative
19	26	2½ months	50	44	None	40.	0000000000	.0740	Negative
20	20	3 months	180	5	Slight	67.	0000000000	.0500	Negative
21	19	21 months	250	3	Slight	55.	0123321000	.0606	Negative
22	23	3 years	120	2	None	45.	0000000000	.0625	Negative
23	33	4 years	35	2	None	50.	1112321000	.0657	Negative

* Folin-Wu method.

It is obvious at a glance that no great change, certainly no change in the fluid which may be called pathognomonic, is found in any of these cases. But when the variable findings are grouped certain changes, which are more or less constant, stand out, upon which we believe some reliance may be placed. For convenience are added in the accompanying table our own previous cases and those of Eskuchen (*Zt. f. d. g. Neur. u. Psych.*, 76:568, 1922) and Coope (*Quart. J. Med.*, 15:1, 1921):

	Pleocytosis (over 5 per c.mm.)	Total Protein (over 40 mg.)	Globulin	Goldsol. reaction	Sugar increase
This series, 23 cases....	39%	74%		17%	91%
Foster, 1921, 11 cases...	100%	91%		100%	91%
Eskuchen, 40 cases (under 2 months duration)...	60%		72.7%	85%	82.5%
Coope, 11 cases.....					82%

It is evident from these tables that the fluid characteristic of encephalitis is a clear, colorless fluid, obtained under normal pressure, showing slight increase in total protein and a trace of globulin, with frequently a pleocytosis, usually not high, rarely over 100 cells per c.mm., all of the cells being mononuclear. There may also be a colloidal gold reaction, most often in the so-called "lucetic zone." But the most significant finding is a high sugar reading. These findings are in agreement with a number of writers, and with others we believe them of value in the differentiation of encephalitis from a number of conditions presenting a similar clinical picture.

Perhaps the disease most frequently confused with encephalitis, especially in the early stage, is tuberculous meningitis. In this disease the cells are almost always greatly in excess of the number found in encephalitis, and polymorphonuclear leucocytes are not uncommonly found. The total protein also is greater in amount. Perhaps the most significant difference is in the sugar content, being regularly decreased in tuberculous meningitis, as in fact it appears to be decreased in all forms of meningitis. The accompanying table, covering all of the cases of tuberculous meningitis which have come to us during the past year illustrates this point:

TUBERCULOUS MENINGITIS				
Case	Cells	Total protein	Gold chloride	Sugar
1	230	118	0001331000	.0321
2	325	500	0000455442	.0100
3	200	100	0003444210	.0400
4	310	77	1123455210	.0250
5	150	160	0002222200	.0410
6	485	400	0000000000	.0364
7	62	138	0000000000	.0006
8	203	235	0012333110	.0010
	202	226	0000122100	.0010
9	106	500	0001122222	.0010
10	119	190	0000000000	.0009
11	210	400	0012333210	.0350

In syphilis of the nervous system of the type which may be confused with encephalitis the Wassermann reaction is usually present.

Also the total protein is commonly greater and the globulin reaction stronger, and in many cases the cells more numerous. In multiple sclerosis in the progressive stage, the type which may be confused with encephalitis, it has been our experience to obtain strong colloidal gold curves, frequently in the "paretic zone."

In conclusion, we believe that encephalitis usually gives a abnormal fluid which, while not representing pathognomonic features, is quite different from that found in tuberculous meningitis, and other forms of meningitis, and that it is usually unlike that of the types of syphilis and multiple sclerosis which clinically resemble encephalitis.

Discussion: Dr. M. D. Ordway: How does the spinal fluid in acute chorea compare with acute encephalitis?

Dr. Ayer: I remember only one case that we have had, and we thought that encephalitis. May not a choreic syndrome be produced by an encephalitis?

Dr. D. J. MacPherson: With regard to Dr. Ayer's question of sugar: We had one crucial case at the Brigham Hospital where a woman in late middle life presented a clinical picture suggesting either tuberculous meningitis or encephalitis lethargica. The sugar in the spinal fluid, by quantitative tests done at the Boston Psychopathic Hospital, was reported as above normal. Because of this the diagnosis of encephalitis was considered more probable. At autopsy she proved to have tuberculous meningitis. Increased sugar in the spinal fluid though suggestive should not be accepted as an absolute criterion of encephalitis.

Dr. Percival Bailey: I should like to ask Dr. Ayer to state a little more definitely about the type of gold test. Will he quote figures? I should like to tell briefly of a case that came into the Peter Bent Brigham Hospital. The patient had become rather dull and unable to do his work as a mechanic in an automobile factory. The diagnosis was brain tumor. We made a diagnosis at the hospital of general paresis. He was sent in for lumbar puncture; Wassermann feebly positive, gold sol typical of general paresis. He remained in the hospital, was given antisyphilitic treatment without any effect, continued to develop meningeal symptoms, and grew increasingly sick, and we thought he might have tuberculous meningitis. There were 145 lymphocytes in the fluid. It was thought by some that he might have encephalitis lethargica. Spinal fluid was taken again and this time there were some 386 lymphocytes, sugar normal, and Wassermann negative. This time we got a meningitic gold curve. The diagnosis was decidedly dubious. The patient died. He never ran a temperature in the whole course. At autopsy there was found what looked to be a perfectly definite tuberculous meningitis, but microscopic examination proved it to be a case of torula histolytica. The torulae had been counted as lymphocytes in the spinal fluid. It taught me a good lesson, namely; to make a histologic examination of every spinal fluid having over a hundred cells.

Dr. Ayer: With reference to the gold chloride tests. All except one was in the so-called luetic zone. Others have reported paretic

zone reactions. In the previous series of 11 cases the fluid findings were similar to the present, so I think there is some value in putting them together. It is interesting that the blood sugar was normal. We had one syphilitic meningitis with 500+ cells, with sugar below normal. It seems as if there was something about the meningitis that causes sugar to drop, whatever the cause is.

I don't wish to be considered an extremist on making a diagnosis on the spinal fluid findings, but I do believe the spinal fluid should have a place in the consideration of the diseases mentioned; if one doesn't try to read too much into the examination, I think one may get benefit from it.

A SECOND CASE OF ASCENDING COMPRESSION MYELITIS ASSOCIATED WITH UNUSUAL PATHOLOGY

Dr. Harold I. Gosline and Dr. Owen L. Murphy read this paper. The first case was originally presented by Drs. Weatherby and Gosline in the *JOURNAL OF NERVOUS AND MENTAL DISEASE* of March, 1920. That patient, following a fall, had pain in the left thigh which spread over his back. Two days later the left leg became paralyzed and the following day, the right leg. There was retention of urine and feces. On the afternoon of the third day, there was anesthesia over the left upper abdomen to the level of the ninth thoracic nerve root. Complete flaccid paralysis of both legs was found together with absent reflexes. Two days later (fifth day) there was total anesthesia to a line corresponding to the seventh thoracic nerve root. Above the hyperesthesia corresponded to the fifth and sixth thoracic. Flaccid paralysis existed from the waist down and plantar stimulation caused flexion, then extension, then a momentary spasm of all the muscles of the thigh.

The second case had a long course of 13 years of chronic respiratory infection following pneumonia. He developed influenza in March, 1923, and appeared to have recovered when he suddenly complained of urinary retention, constipation, and severe pain. The same day the body was hyperesthetic below a line drawn between the sixth costo-chondral junction and the seventh thoracic vertebra. Knee-jerks were sluggish and he had to be catheterized. The next day there was bilateral flaccid paralysis, complete anesthesia with a belt-like area of hyperesthesia above.

In the first case there was a massive fibrinopurulent membrane over the left lower lobe which had been broken into the spinal canal epidurally by direct extension. In the second case a similar exudate existed though no connection with the body cavities could be demonstrated. The appearance of the tissues and the relation of influenza bring up the question as to whether the causative agent of influenza may not injure other tissues as well as the lung, thus allowing invasion of these other tissues, as well as the lung, by secondary organisms.

The second case was one of mental disease. There is considerable evidence that the mental disease in this case may have been related somehow to the chronic infection in his respiratory tract.

Discussion: Dr. J. B. Ayer: Can you elucidate the problem a little? What was the organism found?

Dr. Gosline: In the first case it was not cultivated. In the second, it was pneumococcus. Influenza may harm other tissues and subsequently allow it to invade other parts of the body. From the neurological standpoint, the exudate gradually compresses the cord and produces symptoms in the usual way.

Dr. J. B. Ayer: There are three points of especial interest to me in connection with Dr. Gosline's cases. The first point concerns the origin of the pus found extra-durally. Apparently in these two cases the invasion of the epidural space was from the lungs. On looking up the subject some years ago I found that the focus was usually in the vertebrae. Dr. Viets and I reported a case in which the primary focus was in the breast.

The second point of interest is the considerable period during which infection may remain in the epidural space without passing to the subarachnoid space. In these cases a few days only seem to have elapsed before the organisms passed through the dura. In one case of mine, the fluid was sterile at necropsy in which cord compression by pus must have been present for nine days; another case was sterile four days from onset of cord symptoms, and meningitis was delayed many weeks thereafter. The two cases referred to were infections with *staphylococcus aureus*.

The third point, most important from the point of view of prognosis is this: How much of the paralysis is due to compression from the epidural exudate, and how much is due to myelitic degeneration? In one of the cases referred to, the cord was diffuent at the level of compression after nine days; in the other, although operation was promptly undertaken at Dr. Taylor's insistence on the fourth day of symptoms, release of pus resulted in no benefit. It is therefore likely that, while organisms do not readily pass through the dura, toxins do, and that epidural abscess causes transverse myelitis both by compression and by setting up a true toxic myelitis. These findings are of great interest in connection with the experimental work of Orr and Rowes.

"DIE SCHIZOPHRENIE"¹

Dr. James V. May presented an abstract of some recent work done in the German Clinics on the Schizophrenia problem. The first contribution to which he called attention was one by Dr. Karl Wilmanns, Director of the Psychiatric Clinic of the University of Heidelberg, at a meeting of the Southwestern German Psychiatric Association at Heidelberg in October, 1921. It constituted a very elaborate review

¹ *Zeitschrift für die gesamte Neurologie und Psychiatrie*, Vol. 78, Nos. 4 and 5.

of the history of dementia praecox and the development of the schizophrenia concept. In the words of Willmanns, it is largely the history of psychiatry during the last thirty years. Kraepelin's viewpoints are elaborated in full, with a detailed discussion of the contribution of Bleuler on this subject. The latter, according to Willmanns, "denies the occurrence of schizophrenia-like phases in manic-depressive insanity, doubts the justification of Birnbaum's conception of the delusion elaboration of degenerates, thinks that alcoholic paranoia should be considered as schizophrenia precipitated by alcoholism, is doubtful as to the schizophrenia-like psychoses associated with brain injuries, intoxication and infections, and is inclined to assume in all of these cases combinations of schizophrenia with other psychoses or the precipitation of schizophrenia through mental or physical traumata."

Bleuler's teachings are derived from materials from two very different sources, association psychology and Freud's psychoanalysis. "Bleuler's mistake is the mistake of Freud, the view that fundamentally everything psychic has a determined significance." Jaspers' "phenomenological" views are fully explained. Kretschmer's "sensitive delusions of reference" are discussed as well as his theories as to the "multiple dimensional" or stratum diagnosis, with his studies relating to constitution and character. This is followed by Birnbaum's differentiation between pathogenetic, pathoplastic and provocative factors as basic symptoms, the determinants of the structure of the psychosis concerned. Kraepelin's conception of dementia praecox is referred to as "a well defined endogenous disease which seized those predisposed thereto like an inevitable fate and followed a prescribed course like paralysis, scarcely influenced by external influences." Jaspers' "Schüben" and reactive states are given an extended consideration.

The relation between emotional shocks and war neuroses is covered in studying the etiology of schizophrenia. The relation existing between imprisonment and the development of schizophrenia is looked upon as being of great significance, the preponderance of the chronic mental disturbances in life prisoners being of that type. The relation between head injuries and schizophrenia is reviewed briefly. Emphasis is placed particularly upon predisposition, character, temperament, and the constitution.

The heredity studies of the German Research Institute are referred to, as well as Hoffman's studies of dementia praecox families. Kretschmer's schizoid and cycloid constitution are given considerable space. This is followed by Kretschmer's correlation of the mental constitution with the physical structure of the patient. The pyknic, asthenic, athletic, and dysplastic types are considered. The schizophrenics are divided by Kretschmer between the asthenic, athletic, dysgenital, and other dysglandular types. Kretschmer also studied, as did Kahn and Hoffman, the heredity of the premorbid personalities. He even adapted his theories to the classification of nonpsychotic individuals. Kretschmer's deductions from structural

analyses are not accepted by Wilmanns as convincing and he looks upon them as fundamentally wrong. Some attention is devoted to the histological studies of Kleist and others. Particular attention is given to the development of schizophrenic symptoms in the course of encephalitis lethargica as significant of involvements of the basal ganglia in dementia praecox. The endocrine origin of schizophrenia is given careful consideration, with particular reference to the sexual glands and the theory that dementia praecox is an expression of pluri-glandular insufficiency. The influence of mental factors on the progress of endocrine functions is recognized. Erdheim's studies of hyphophyseal disturbance and his trophic center in the hypothalamus are mentioned, as well as Aschner's researches relating to the third ventricle.

Wilmanns concludes that "Probably the brain, like the liver, the spleen, the lymph glands, the bone marrow, and the intestinal glands, may be assumed to be a link in the endocrine chain, the harmonious working of which is interrupted when only one link fails." He believes, in reviewing the situation, that all avenues of research must be given adequate consideration so long as their limitations are appreciated, and that in spite of the great progress that has been made in the study of schizophrenia, we are still far from completing our knowledge of that disease.

IN MEMORIAM

We, the members of the Boston Society of Psychiatry and Neurology, assembled in regular meeting, lament the sudden removal by death of Dr. Herbert Burr Howard on March 6, 1923, and with unwonted sadness we feel his absence from the accustomed place amongst us.

Our deepest sympathy reaches out to the sorrowing family in their loneliness: With them we cherish the memory and achievements of his noble life, and with the community and the State we realize the irreparable loss sustained by the public service which he honored.

Dr. Howard's connection with this society dates back to the early days: He served as its honored president and we are proud of his services, as physician, as hospital superintendent and in the many positions of honor that he filled and especially for his many activities in relation to matters for which this society stands.

We realize that throughout his career, dealing mostly with general hospital problems, he was voluntarily concerned in all matters relating to the mentally ill, and rendered invaluable and pioneer service in framing the laws and in the upbuilding of institutions for their care.

He was an influential member and for a number of years chairman of the State Board of Insanity, chairman of the Board of Trustees of the Gardner State Colony, president of the National Hospital Association and chairman of the Hospital Section of the

American Medical Association. He held membership in various medical societies.

Through the many years we have felt the influence of his ideals, the warmth of his fellowship, the wisdom of his counsel and the depth of his interest in psychiatry. The members of this society, many of whom are no longer with us, were his most intimate friends and have prized his friendship, the honesty of his convictions and his rugged good humor along with the refining qualities of his kindly nature, whose most cherished purpose was to help those who were in distress.

We would make these sentiments a part of our permanent records and transmit copies to the members of the bereaved family.

JOHN H. NICHOLS
HENRY R. STEDMAN
GEORGE T. TUTTLE

CURRENT LITERATURE

I. VEGETATIVE OR VISCERAL NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Van Schelven, Th. LUMINAL IN MIGRAINE. [Nederland. Tijdschr. voor Geneeskunde, 1921, LXV, October 1, 1673.]

In view of the hypothetical relationship between the vascular reactions in epilepsy and migraine, van Schelvan has tried luminal in migraine with unexpectedly good results even in old-standing and very obstinate cases. All his cases here recorded were under forty years of age, and in every one of these there has been complete cessation of attacks of pain for over a year. He begins usually with a dose of fifty milligrammes a day: this may be enough in early life, but usually it is not. By a gradual increase of the dose a point is reached where the attacks of pain are abolished. At regular intervals the urine is examined, and at longer intervals the blood-picture also. Up to the present time van Schelven has had good results in all his cases thus treated, and no bad effects have been seen. He pleads for a trial of this drug in migraine by other physicians. [LEONARD J. KIDD, London, England.]

Wolfe, S. MIGRAINE, ITS CAUSE AND TREATMENT. [Northwest Medicine, October 1921, p. 288.]

The author draws attention to the recent theory of Didsbury and Nordstrom, of migraine being a neuritis and cellulitis, located at emerging nerve points on face, head, and neck. The theory is attractive, and if it can be sustained, much simpler than the endocrine and vasomotor theories, and very direct in its therapeutic indications. The biochemic reactions are what must be looked into, if we are still driven back to former explanations of its etiology. The tendency to appearance about puberty, and disappearance at the climacteric, and in males about the same period, seems to implicate the gonads. In the author's opinion, this term should be restricted to seizures which are periodic and where a clear underlying cause can not be found. Migraine does not include neurasthenic or hysterical headaches, although it can be complicated with these. The psychic, temperamental and social factors in its etiology must be regarded. Attacks may be suspended during pregnancy, generally to be resumed after delivery, although the suspension may last during the whole period of lactation. This again points to gonadal involvement. Migraine may interchange with epilepsy in any of its forms, or may

become substituted for the epilepsy, or epilepsy for the migraine. The latter is the rarer event. Certain migrainoid attacks preceding or accompanying tabes or paresis, should be carefully differentiated. The forms that occur without head involvement offer much difficulty in the diagnosis, which is often completed by the occurrence of an occasional head spell. The headaches of malaria, syphilis, gout, anemia; of brain tumor; of renal disease; of hysteria, neurasthenia, etc., must, of course, be ruled out, although we should not forget that a migraine subject is amenable to any of these conditions. In treatment, we may find endocrine substances available, when we get farther along. Till then we must still rely on the rest and quiet which is sufficient with some; the coal tar analgesics, where we must have actual drugs. The author thinks that cannabis indica is about the best drug, between the attacks. If Didsbury is right, then we have a clean cut therapy in massage of the tender spots. If morphine be resorted to, great care to avoid the habit should prevail. [Author's abstract.]

Lubbers, H. A. MIGRAINE AND ANAPHYLAXIS. [Nederlandsch Tijdschrift v. Geneeskunde, August 1921, II, No. 8.]

This communication deals with food factor possibilities in certain migraines. He outlines the case history of a woman with migrainous attacks. She kept a strict record of all she ate and drank. This record seemed to show that the migraine occurred only following the ingestion of beans. The blood picture at these periods showed that the number of leukocytes declined slightly within half an hour after test ingestion of beans, and the migraine developed eight hours after the meal. Skin tests were negative, but preventive ingestion of 0.5 gm. of peptone before eating the beans warded off the attack of migraine, although she felt chilly and drowsy. He remarks that since commercial peptones are so multiform in origin a specific proteid is not to be expected.

Kylin. DAILY VARIATIONS IN THE BLOOD PRESSURE IN HYPERTONUS. [Zentralbl. f. inn. Med., May 28, 1921.]

In this paper are recorded a series of readings of variations in blood pressure in nephropathies since there are great inconstancies night and morning. This led the author to attempt to obtain an independent idea of the physiological variations of the blood pressure and hence observations were first made on 10 patients who showed no symptoms of renal or vascular disease. The blood-pressure charts in these cases showed only slight changes from day to day, not exceeding 5 to 10 mm. Hg. The morning readings were usually lower than the evening ones. In mild cases of contracted kidney, on the other hand, the blood-pressure curves were quite different. The changes from day to day were considerable, often being 50 mm. and more, the greatest difference noted being 75 mm. Hg. in the course of twenty-four hours. These great variations from day to day are interpreted by the author as due to a

functional constriction in the vascular system. He points out that now that it has been established that the blood pressure is so liable to change, it is not sufficient to measure it, as before, once or twice a week, or even every morning or every evening, but in every case of hypertonus it should be measured both in the morning and evening until a definite idea of the extent of the daily variations has been obtained. In acute glomerular nephritis the blood pressure is quite different from that in mild contracted kidney. In some cases the rise of blood pressure is considerable and in others fairly slight. The variations from one day to another are relatively small, although greater than under physiological conditions of the usual type.

Smithies, F. CARDIOSPASM. [*American Journal of Medical Sciences*, September 1921, CLXII, No. 3.]

This paper presents an interesting analysis of certain mechanical factors in 76 cases of cardiospasm with diffuse dilatation of the esophagus. The ailment seems to be relatively common in those individuals who give outward manifestation of being physically and mentally on the go. In 17 instances the associated dysphagia was acute in its inception. In 30 cases the affection appeared gradually and was not infrequently punctuated by attacks of exaggerated distress. Dysphagia is not commonly painful. Smithies considers it of diagnostic significance that liquid foods are more apt to bring about distress. There was constant dysphagia in 45 cases. There was dysphagia to fluids only in 21, to solids only in 14 and to all foods in 12 cases. Dysphagia is nearly always accompanied by vomiting or spasmodic food regurgitation so long as esophageal muscle tone remains good. The roentgen-ray examination is of great aid in diagnosis but the evidence which it supplies is not infallible. If the affection is properly managed, there is clinical and functional recovery in about 70 per cent of even well established instances of cardiospasm. Improvement occurs in 20 per cent. About 10 per cent of the patients are not permanently benefited by any form of treatment at the most expert hands. The lesion seemingly resists all forms of therapy. The author shows no acquaintance with the obvious psychogenic indices in his patients and indicates little evidence of knowledge of the obvious psychopathology in many.

Briscoe, C. ORIGIN OF ANGINAL SYNDROME. [*Lancet*, December 17, 1921, II, No. 5129. J. A. M. A.]

While testing the action of accessory muscles concerned in respiration, Briscoe noted that some of these muscles varied greatly in intensity of action and stress in different positions of the body, and in different circumstances. When under stress these muscles became tender, and when pressure was made on these tender muscles the pain produced was not always a mere local sensation, but was referred to wide areas very similar to those concerned in angina. Next he found that in some cases

which had suffered from anginal type of pain, pressure on certain of these muscles produced pain like that of the attack, and finally in some cases of angina relief of tension in these muscles was followed by cessation of pain. It is quite evident that overfatigued muscles give rise to referred pain in distant areas. The upper thoracic respiratory mechanism is excessively active under the same conditions in which attacks of angina pectoris usually occur, and stress of this nature affords a better explanation for nocturnal attacks than does cardiac strain. The respiratory muscles of this region, when hypersensitive, are the last structures in the segment to lose local tenderness and the faculty of producing referred pains by pressure. When these muscles are hypersensitive and subjected to pressure the areas to which pain is referred correspond to those similarly affected in angina pectoris, and are frequently recognized. A phenomenon is demonstrated by Briscoe which offers an explanation for the warning and sequence of spread of pain in angina pectoris. This is dependent on irritation of one of the expiratory muscles involved, and results in marked thoracic elevation. Treatment by alleviating the stress of these muscles has frequently—not always—been effective in relieving the pain without other treatment. Two attacks of angina pectoris have been observed as the result of irritation of respiratory muscles. Briscoe submits that the phenomena generally which accompany an attack of angina pectoris can equally well be explained on a respiratory hypothesis as on one of vascular origin. Further, the age incidence of angina pectoris corresponds with that of ossification of the ribs and cartilages—a source of increased difficulty in respiration.

Pal. CARDIOSPASM. [Wien. klin. Woch., June 16, 1921.]

This paper deals categorically with the general subject. He summarizes the causes of cardiospasm, or spasmodic contraction of the cardiac end of the stomach, as follows: (1) disease of the neuromuscular apparatus (paralysis, atony); (2) primary reflex, central or peripheral stimulation of the cardiac orifice; (3) disease of the vagus. Primary cardiospasm occurs in three forms—namely, an acute, an intermittent, and a chronic form. The acute form is usually caused by a sudden irritation of the cardiac orifice and very rapidly subsides. Some persons react to psychological excitement by cardiospasm. The condition is sometimes accompanied by very alarming symptoms, such as syncope and stoppage of the heart, probably from irritation of the vagus. Chronic cardiospasm frequently commences in an intermittent form. Such cases are, as a rule, pure neuroses, and are often associated with pylorospasm or bronchial spasm. Various causes have been incriminated, such as mediastinal gland tumors, bulbar disease, trauma, carcinoma, gastric ulcer, infectious diseases (influenza, diphtheria), intoxication (lead), and metabolic diseases. The most frequent underlying cause is psychogenic. True cardiospasm is manifested by stoppage of

food in the region of the cardiac orifice. The condition may be mistaken for angina pectoris or cardiac asthma. The symptoms are caused, to a great extent, by the efforts to swallow leading to dilatation of the esophagus, which occurs more rapidly and in greater degree than in organic disease. The esophagus assumes an S-shaped appearance, and the displacement of the neighboring organs may give rise to alarming symptoms. The condition must be distinguished from deep-seated diverticula and from carcinoma of the cardiac end of the stomach. X-rays aid in the diagnosis. In the intermittent stage atropine and papaverine are effective, but not later. Dietetic measures are indicated according to the case. Psychical factors must be considered. In cardiospasm of long standing in which structural changes ultimately take place in the esophagus surgical interference is required.

Mutch, N. TREATMENT OF CARDIOSPASM. [Practitioner, November 1921.]

In this thoroughly conventional paper the author mentions some of the methods that have been employed in the treatment of cardiospasm and states that in the fully developed disease, permanent and complete relief can be obtained only by dilation of the cardiac sphincter. Stretching must be so severe as to paralyze the muscle temporarily, much in the manner as temporary paralysis of the sphincter ani is secured by stretching in the treatment of certain diseases of the rectum. The earliest attempts to accomplish this were made from below the diaphragm at laparotomy. The best method, however, is to introduce a rubber bag into the upper orifice of the stomach and then distend it until the sphincter has been sufficiently stretched. A gum-elastic esophageal tube is used, which is closed at the lower end, but perforated laterally two or three inches from the point. Over these holes a rubber bag is fitted and is prevented from overdistention by a stout silk fabric incorporated in its walls. At lower tensions the bag is narrower in the middle than at the end, so that it does not tend to slip out of position after it has been inserted through the cardiac orifice. At higher tensions it becomes widest in the middle, and so exerts its greatest distending action at this point. At the upper end of the tube a small stop-cock is fitted. At the lower end is a metal olive pierced for the reception of a silk guide. Water is chosen as the distending medium because, at the pressure used, its volume remains constant. In the event of the bag breaking no explosive force is brought to bear on the esophagus such as would follow the rupture of a bag of compressed air. The most convenient source of pressure is the water main, and the pressure can be measured by attaching a manometer. The pressure should be equal to about 24 feet of water. The procedure of dilatation is carried out with the patient seated before an X-ray screen so that the bag may be properly located half way through the cardiac orifice. The prospect of permanent cure which this method offers is very great. The best records are those of

Plummer, who followed up the subsequent histories of about 100 cases of severe, uncomplicated cardiospasm, treated by forcible dilatation. Eighty-one per cent were completely cured (of the dilatation maybe, but of the underlying causes for it[?]); 12 per cent were partially relieved, and the remainder could not be traced or had died of intercurrent disease.

Hitzenberger and Richter-Quitterer. VASCULAR HYPERTONIA. [Wiener Archiv. für innere Medizin, Vienna, February 15, 1921.]

This is a study of the sugar metabolism in certain patients with cardiovascular hypertonus. The blood sugar in 38 cases of high blood pressure is presented. Hyperglycemia was the rule with both primary and secondary vascular hypertonia. The hyperglycemia in these conditions is independent of the diet. It is apparently not the result of disturbance in assimilation but overproduction of sugar. There is frequently an excess of uric acid in the blood also in these patients, but this is not due to retention of uric acid. They assume that the triad, hypertonia, hyperglycemia and hyperuricacidemia may result from an excess of epinephrin. The vascular hypertonia is the most prominent symptom, but the hyperglycemia is equally constant, and both seem to be the manifestation of some disturbance in metabolism, possibly from increased functioning of the chromaffine tissues. Other factors such as alcoholism, tobacco, excessive protein, emotional stress, syphilis, and lead poisoning may complicate the picture, according as these phenomena develop in brain or heart or kidneys, a cerebral, a cardiac, abdominal or kidney type.

Cannon, W. B., Rappert, D., and Uridil, J. E. STUDIES ON THE CONDITIONS OF ACTIVITY IN ENDOCRINE GLANDS. VI. Further observations on the denervated heart in relation to adrenal secretion. VII. The reflex center for adrenal secretion and its response to excitatory and inhibitory influences. VIII. Some effects on the denervated heart of stimulating the nerves of the liver. [Am. J. Physiol., 1921. LVIII, 308, 338, 353.]

The adrenal medulla is subject to reflex stimulation. The reflex center is situated immediately posterior to the corpora quadrigemina in the floor of the fourth ventricle. This is in agreement with the results obtained by Elliott and by Anrep. This center is subject to inhibitory influences which reach it by the vagus or the depressor nerves. In the third paper the interesting observation is made that stimulation of the hepatic nerves liberates a substance from the liver which causes the heart to beat faster even when the adrenals are absent. This effect is more distinct in well-fed animals than in fasting animals. A further communication on this point is promised. These three papers also contain much controversial matter, since they represent a continuation of the controversy which has been going on for a considerable time between

Cannon on the one side and Stewart and Rogoff on the other. The latter authors deny that the adrenal glands secrete adrenalin as the result of reflex stimulation and admit only a slight continuous secretion of adrenalin. Cannon refutes in these papers the criticism which Stewart and Rogoff have raised against his method of inferring an increased secretion of adrenalin from an increased rate of the denervated heart. [Medical Science.]

Loewy, O. ON THE HUMORAL TRANSFERABILITY OF THE ACTION OF THE CARDIAC NERVES. I. [Arch. f. d. ges. Physiol., 1921, CLXXXIX, 239.]

If the fluid with which a frog's heart is perfused is collected during a period over which the heart is inhibited by stimulation of the vagus, this perfusate will produce on a normal heart effects similar to those of vagus stimulation. Similarly, after stimulation of the accelerators (heart atropinized) the perfusate will cause acceleration of a normal heart. The author believes that inhibition and acceleration may be due to the production of specific substances.

Engelbach, W. ARTERIAL HYPERTENSION ASSOCIATED WITH ENDOCRINE DYSCRASIA. [J. A. M. A., June 12, 1920.]

In an analysis of more than 500 endocrine cases observed by this author during the last four years, it was found that 46, or about 10 per cent, had a blood pressure of above 160. Those cases in which a diagnosis of nephritis or arteriosclerosis was suspected were excluded. Of the 46, the highest percentage of arterial hypertension was found among the pluriglandular dyscrasias. Fourteen of the 46 or 30 per cent, were classified as having more than one gland involved, with none so sufficiently dominating the picture or initiating its course that it might be considered the primary secretory disturbance, with the other glands classed as secondary. Combinations of the pituitary and thyroid hyposecretions were present in 12 cases, or about 26 per cent, of the hypertensive cases. The next highest percentage, 11 cases, or one fourth of the entire number, occurred at the menopause. In cases in which there were glandular disturbances apparent in the group, they were merely considered as a part of the climacteric. For instance, in four there was evidence of hyperthyroidism; in three, hypothyroidism, and in two hypopituitarism. Of the primary gonad insufficiencies, there were four cases, or 9 per cent; one in a eunuchoid person, two in a late, and one in an early castrate. The next in frequency was the thyroid group, with eight cases, or 17 per cent, classified as pure hypothyroids, and four, or 8 per cent, as hyperthyroids. The pituitary group ranged lowest in number, five cases, or 11 per cent, being classified as simple dyscrasias of this gland. Of this number, four were hypopituitarism and one hyperpituitarism. One of these was a case of pituitary hibernation, one a case of pituitary headache (both reacted to substitution pituitary

treatment), one a hypophysial glycosuria, and two eunuchoid giants. Cases are cited, and the literature on arterial hypertension associated with endocrine dyscrasia is reviewed.

Santos, R. N. ANESTHETIC ERYTHROMELALGIA AND CHRONIC PARESTHETIC ACROERYTHROSIS WITH ERYTHROMELALGIC CRISES. [Arch. de Neurobiologia, Vol. II, No. 2, 1921, 171.]

In the vasomotor neurosis, which the writer calls a chronic paresthetic acroerythrosis with erythromelalgic attacks, there was chronic erythrodermatitis of the ends of the extremities together with burning, stabbing paresthesia and at times severe pain of the erythromelalgic type. The acroparesthetic features of such cases distinguish them from similar erythrodermatitis, the chronic character of the vascular disturbances from vasomotor acroparesthesia. Nevertheless there are intermediate forms between true acroparesthesia and acroerythrosis paresthetica. The writer describes also cases of erythromelalgia which are unusual because of the loss of sensibility in the parts visibly affected.

Bard. ANGINA PECTORIS AND RAYNAUD'S DISEASE. [Presse Méd. January 26, 1921, XXIX, No. 8.]

The author here reports a case in a man of thirty-three in which there were periodic interchanges between angina pectoris, Raynaud's disease, loss of one eye from disturbance in the circulation in the retina, and intermittent claudication. The first symptoms were an attack of angina pectoris after a bombardment, and the man died in a similar attack two years later. The existence of these four different localizations, all on the left side he assumes pointed to a nervous origin for them all, and seems to exclude local endarteritis. The attack in the fingers was brought on by cold, the attack in the toe by walking, the angina pectoris by fatigue and emotions. The fatal outcome in this case shows that even attacks of psychogenic origin may prove fatal. A spasm in an artery which is capable of producing total anemia in a finger may well arrest the action of the heart when the spasm should locate itself in the coronary arteries.

Stewart, J. Purves. RESPIRATORY IMPLICATIONS IN NERVOUS DISEASE. [Br. Med. J., December 17, 1921.]

In this paper respiratory symptoms in cerebral lesions, due to concussion, hemorrhage, thrombosis, or embolism; those due to cerebral meningitis, cerebral abscesses or intracranial tumors, and those due to bulbar lesions, spinal cord lesions, peripheral nerve lesions, and muscular affections are discussed. When respiratory affections are due to these causes they are mainly paralytic. The spasmodic respiratory affections may be due to disease either of the vegetative or the cerebrospinal nervous system. With regard to the vegetative nervous system, the most important spasmodic affection is asthma, whose phenomena of labored

breathing consist essentially in spasm of the nonstriated bronchial muscles, enervated by the dorsal motor nucleus of the vagus. Coughing, yawning, sneezing, and hiccough are all of them reflex phenomena which may be induced in healthy individuals by appropriate stimuli. Of these hiccough calls for special mention. It is a spasmodic myoclonic contraction of the diaphragm, occurring so suddenly that the glottis is suddenly closed by suction, producing the characteristic inspiratory noise. Hiccough is sometimes excited by transient gastric or other abdominal irritation; it may be due to disease of the peritoneum in the region of the diaphragm (the phrenic nerve being sensory as well as motor in function). Other cases of hiccough are due to central disease of the respiratory centers in the medulla; thus it may be produced by epidemic encephalitis. Hiccough of this kind may continue for days at a time, at the rate of twelve to fifteen hiccoughs per minute. Hiccough may also occur as a terminal symptom in tumor of the posterior fossa of the skull. One may also meet with cases of psychogenic hiccough, which are recognized by their history and concomitant phenomena, and the symptom promptly subsides under appropriate treatment. Other spasmodic affections in which the respiratory mechanism is upset are whooping cough, laryngismus, tetanus, rabies, major epilepsy, athetosis, chorea, and exophthalmic goiter. Various respiratory phenomena may be met with in hysteria. Of these psychogenic is the commonest, but rapidity of respiration, psychogenic sobbing, and all sorts of curious laryngeal noises may be met with in different cases, but whatever their variety they cease during sleep. Psychogenic cough is unaccompanied by true dyspnea, while abnormal physical signs in the respiratory organs are conspicuous by their absence. Psychogenic rapidity of breathing is without cyanosis or other respiratory distress, and the pulse remains quiet and steady. Respiratory tic or habit-spasms are frequently noted in highly strung, often highly intelligent, individuals of psychasthenic nervous constitution. Such persons are not necessarily mentally inferior; on the contrary, some of them are far above the average of intelligence. These respiratory tics are psychomotor affairs of cortical origin, and never interfere with voluntary movements.

Marine and Lenhart. INFLUENCE OF GLANDS WITH INTERNAL SECRETIONS ON RESPIRATORY EXCHANGE. [Am. Journ. of Phys., December 1, 1920, LIV, No. 2. J. A. M. A.]

The effect of subcutaneous injection of epinephrin on normal and thyroidectomized rabbits was studied by Marine and Lenhart. Their results on rabbits confirm those of Sandiford on man. Epinephrin causes a rise in the oxygen consumption both in normal and thyroidectomized rabbits. The absolute rise may be greater in normals but the percentile rise may not be altered. Evidence is given that, in general, the onset of the rise in oxygen consumption following epinephrin is delayed in thyroidectomized animals and also that it does not last so long.

Chavanne. CHRONIC CATARRHAL PHARYNGITIS. [Méd., January 1922, III, No. 4., J. A. M. A.]

In discussing the local and general treatment of chronic pharyngitis, Chavanne emphasizes the importance of the neuroarthritic diathesis (whatever this is?) and of a sedentary life in predisposing to recurrence of pharyngitis, saying that the throat often spontaneously returns to clinically normal after a good gallop or mountain climbing. He adds that the men in the trenches found that their chronic pharyngitis was temporarily cured, notwithstanding the cold and the wet.

Hurst. SUPRARENALS IN ASTHMA. [N. Y. Med. Journ., March 15, 1922, CXV, No. 6.]

It is well known that adrenalin will stop the spasm of the bronchi in asthma and the present author gives us another clinical observation to add to its many predecessors. He is concerned with immediate and superficial rather than with more remote and fundamental problems.

Rubow. THE CAUSATION OF BRONCHIAL ASTHMA. [Ugeskrift for Laeger, September 8, 1921.]

This paper is a partial protest against an exclusive tendency to regard asthma in the light of a pathological vagotonia. In 45 out of 60 cases of asthma treated at his hospital the disease developed in previously healthy persons as a sequel to acute bronchitis or in the course of chronic bronchitis. In some cases the asthma dated from childhood, and only in 6 cases did the asthma begin suddenly without any apparent illness to provoke it. The condition observed in these 6 cases is doubtless more common in private than in hospital practice, and it probably includes the group of cases now associated with anaphylaxis. The remarkable effect of adrenaline on asthma does not necessarily prove it to have a purely nervous origin, for the dilatation of the bronchi effected by adrenaline should help the asthmatic, whether his symptoms are due to spasm of the bronchi or catarrhal swelling of their mucous membranes. The author has found that the subjects of asthma are not more intolerant than healthy persons to CO_2 inhaled for six minutes in strengths of 6, 8, and 10 per cent.

Sanford. PROTEIN SENSITIZATION IN ASTHMA AND HAY FEVER. [Minnesota Med., April 1920.]

This is a record of the result of 800 tests made during his last two years at the Mayo clinic. As a rule no patient was tested unless he was suffering from asthma or hay fever. More than 500 cases were entirely negative in their skin reaction, though tested with numerous proteins. Some eighteen or more proteins dissolved in decinormal sodium hydroxide were used. Sanford found that more than 200 cases gave definite skin reactions; 28 reacted positively to some of the animal emanations, the majority of these being to horse dander. No less than 100 cases reacted

to one or several of the proteins derived from food, the greatest number of reactions being to egg white; 25 patients had marked positive reactions to grain—wheat, rice, and rye being the common kinds; 28 patients were sensitive to vegetable proteins. Fruit apparently had little to do with asthma, though in several instances banana gave marked reactions. In 365 tests with *Staphylococcus pyogenes aureus* and *albus* there was not a single reaction. The most interesting group, and one that gave very definite results, was made up of those persons sensitive to pollens. Persons sensitive to animal emanations may be desensitized for a considerable period by repeated injections of safe but increasingly large doses of the offending protein. In the case of persons sensitive to food proteins attempts at desensitization did not meet with marked success, and the careful elimination of the offending substances from the diet would seem to be the chief method of control. Patients sensitive to pollens offered much greater prospect of successful treatment; in such cases treatment was commenced at least twelve weeks before the earliest date of pollination, starting with a dilution less than that necessary to produce a positive skin reaction, the weekly injections being gradually increased until a few tenths of a cubic centimeter of 1 to 100 extract was attained. The history of the case enabled one to narrow down the list of proteins possibly responsible for the asthma or hay fever.

Patterson, T. L. STUDIES ON THE VISCERAL SENSORY NERVOUS SYSTEM.

IX. THE READJUSTMENT OF THE PERIPHERAL LUNG MOTOR MECHANISM AFTER BILATERAL VAGOTOMY IN THE FROG. [Am. Jour. Physiol., 1921, LVIII, 169.]

The experiments forming the basis of this study were made exclusively on the common laboratory frog (*Rana pipiens*). Healthy, vigorous animals were selected in pairs, one of which was kept as a control, while in the other, one or both vagi were sectioned in the region of the neck after anesthesia. After recovery, the animals were kept under observation for periods of several weeks and even months in many cases and the visible changes in the contour of the flanks and the external respiratory movements were noted and compared with that of the control animals. The control and vagotomized animals were kept in pairs in a compartmental vivarium which was provided with running water, while in all the later experiments they were fed on caterpillars and earthworms in order to maintain normal bodily condition for any depression in the animals might defeat the object of the experiment. To further control any possibility of depression in these animals that might result from the confinement, the vagi were sectioned in many of the control animals five to eight weeks after the nerve section in the first animal but these latter or control animals always reacted in precisely the same manner as the former. As a final check all animals were autopsied at the close of the respective experiments. In animals after bilateral vagotomy the normal contour of the flanks disappears and the body line becomes

straight or even curved in. There is also a destruction or loss of the inhibitory control over the peripheral lung automatism, leaving it free to exert its full influence on the lungs without any check, hence the lungs contract and pass immediately into a state of hypertonus or lung tetanus to such a degree as to nullify their function. In unilateral section of the vagosympathetic nerve there is a loss of the normal curvature of the flank, as well as the inhibitory control over the peripheral lung automatism on the side of the section only, the opposite flank and lung being unaffected, thus demonstrating that the nerve action is unilateral.

In both unilateral and bilateral section of the vagosympathetic nerves there is a gradual physiological readjustment of the peripheral lung motor mechanism which usually begins from 12 to 21 days after the nerve section when the lung begins to be distended by swallowed air, pushing out the flank and finally forming "olive-shaped" prominences. This readjustment was partial in all the animals with but one exception. In this particular case, the animal lived for an extended period of a little over 8 months (247 days) and the complete physiological readjustment occurred at the end of about $7\frac{1}{2}$ months. In other operated animals living for periods of from 2 to 5 months there was always exhibited a greater degree of physiological readjustment in the animals of the longer duration. In animals in which these nerves have been recently cut (2 to 3 weeks), air is found more constantly and usually in greater amounts in the stomach and intestine than in similarly operated animals of longer standing. This indicates that the air is forced into the stomach by the act of swallowing because of the persistently constricted lungs aided possibly by a hypermotility of the esophagus following directly upon the section of the nerves due chiefly to mechanical stimulation of motor fibers and later to a temporary hypotonic stomach. The buccal or passive movements after bilateral vagotomy are little effected if any, whereas the actual respiratory movements (opening of glottis and swallowing of air into lungs) are temporarily abolished, but these movements gradually return with the physiological readjustment of the peripheral lung motor mechanism.

The lung readjustment in these long time experiments is not due to a gradual weakening of the animals from age and starvation, since animals when fed and kept in close confinement react in a similar manner after unilateral or bilateral vagotomy as do normal animals which have not been so confined. Furthermore, the failure of the vagotomized lungs to contract down to practically a solid mass on death or destruction of the medulla in these experiments is evidence that this readjustment is not due to a vagus regeneration. It may be implied, therefore, that this physiological readjustment of the vagotomized lung is brought about through some special or plastic activity of its peripheral neuromuscular mechanism. [Author's abstract.]

Lian, C. PNEUMOGASTRIC ORIGIN OF ASTHMA. [Presse Médicale, December 14, 1921, XXIX, No. 100. J. A. M. A.]

Lian presents evidence to the effect that asthma is a manifestation of overexcitability of the pneumogastric system, and that belladonna is the true treatment for it. Epinephrin has merely symptomatic action; belladonna acts on the cause, and in adequate doses wards off the asthma as effectually as digitalis acts on asystolia. He says that the oculocardiac reflex is an excellent means for estimating the tonus of the pneumogastric, its exaggeration indicating hyperexcitability. He found it much exaggerated in 24 of 31 asthmatics tested, and moderately exaggerated in 5 others, only one giving a negative response. He gives the belladonna extract in 1 cg. pills, three times a day, one before dinner, the others on retiring and in the course of the night. The majority of the patients had no more attacks after the first, second or third night. It improves breathing conditions and promotes sleep, but it does not relieve the cough; this may require something additional. In 2 of his cases the persistence of the asthma under the belladonna convinced him that insufficiency of the kidneys must be responsible, and the nocturnal attacks of dyspnea subsided under a purge, venesection and theobromin with restriction to water.

Ségard, M. PATHOGENESIS OF ASTHMA. [Rev. de Médecine, September-October 1921, XXXVIII, Nos. 9-10.]

The author comments on the fact that in a leading textbook (Brown, 1917) on asthma there are listed 472 works dealing merely with the pathogenesis of asthma. There is evidently not a single cause. Several factors, internal and external, combine in varying proportions in the clinical picture. Vagotonia is an indispensable element, but inadequate alone to induce asthma. Colloidoclasia is an effect, not a cause. These two elements recall the neurosis and the dyscrasia of the old school. Thus the older clinicians, with clinical observation alone, recognized the main elements of the problem. The final solution he thinks must be sought in biology and probably in physical chemistry. [If in biology psychology be included?]

Davison. CASE OF ASTHMA CAUSED BY SENSITIVENESS TO DOG'S HAIR. [Ga. Med. Assn. Journ., February 1922, XI, No. 2. J. A. M. A.]

Davison cites the case of a man, aged forty-one, who had had asthma for 22 years. For several years attacks occurred in the spring and fall only and lasted from 7 to 14 days. These attacks gradually increased in severity and frequency till wheezing was present practically the entire year and the acute attacks occurred during all seasons. Cutaneous tests were made with protein extracts from all the different foods the patient ate throughout the entire year and all were negative. The extract from dog hair gave a strongly positive reaction. Further

questioning of the patient brought out the fact that the attacks of asthma occurring in the spring and fall had usually been after hunting trips and that his dog now slept on the steps of his sleeping porch just by the patient's bed. The dog was sent away and attacks ceased at once. To give this diagnosis a rational test, a lapse of two weeks was allowed. At the end of two weeks, a neighbor's dog was borrowed and the patient played with it for five minutes. Fifteen minutes later a severe attack of asthma began. [No notion of psychogenic factors re. dogs appear to the observer's mind. Ed.]

Traugott, K. EFFECT OF ULTRAVIOLET RAYS ON THE BLOOD. [Münch. med. Woch., March 19, 1920.]

As the result of his investigation, the author finds that exposure to ultraviolet rays does not affect the number of red blood corpuscles in man. Under average conditions the same number of leukocytes are found in the capillary blood and in the venous blood stream. A uniform increase in the leukocytes takes place usually following exposure to ultraviolet rays from 15 to 20 minutes duration. If the exposure be of shorter duration, there will be a difference between the number of leukocytes in the capillary and in the venous blood. The increase caused by the raying affects leukocytes and lymphocytes alike. Another effect on the blood from the influence of the ultraviolet rays is that it coagulates sooner and there is an increase in the number of platelets.

Holt, L. E., and Courtney, A. M. CALCIUM METABOLISM OF INFANTS AND YOUNG CHILDREN. [Amer. Jour. of Diseases of Child., March 1920.]

Holt and Courtney discuss the calcium metabolism of older children taking a mixed diet. Both healthy and rachitic children were the subjects of this study. With children taking a mixed diet, the absorption of calcium per kilogram was lower than that of infants taking modifications of cow's milk, averaging when the intake was adequate, 0.055 gm. of calcium oxid per kilogram. An intake of at least 0.09 gm. of calcium oxid per kilogram is necessary to insure a good absorption by children taking a mixed diet. The best absorption of calcium oxid occurred when the intake of fat exceeded 3.0 gm. per kilogram, and when, at the same time, for every gram of fat there was in the diet from 0.03 to 0.05 gm. of calcium oxid. When calcium in the form of chalk mixture (calcium carbonate) were added to the diet, there was a greatly increased absorption of calcium. When calcium was added as calcium acetate or as calcium phosphate the absorption was not increased. The excretion of calcium was not so closely related to the intake of calcium as in the case of infants taking modifications of cow's milk, and was not at all related to the fat intake. The calcium absorption of children with active rickets was lower than that of normal children, even though the calcium intake was ample. The calcium excretion in the stools was somewhat higher

than the average excretion in the stools of normal children. During recovery from rickets, the absorption of calcium was higher than the average for normal children. This improvement accompanied the taking of cod liver oil or additional butter with a diet containing an ample amount of calcium. The calcium excretion in the stools of children recovering from rickets was lower than in the stools of normal children. Cod liver oil increased the absorption of calcium, except in cases in which the intake of calcium or of fat was very low. The substitution of vegetable fats for milk fat did not affect the calcium metabolism of children taking a mixed diet. [J. A. M. A.]

Leake, C. D. MORPHINE AND THE BLOOD. [J. A. M. A., June 3, 1922.]

Results are presented concerning the effect of morphine on the leukocyte counts in rabbits, dogs and men. There is always the same general leukocytic reaction, namely, a relatively slight leukopenia, lasting for about an hour after the drug, followed by a more pronounced leukocytosis maintained for ten hours or more, and returning to normal within 24 hours. The differential counts show a large relative increase in the number of polymorphonuclear neutrophils, with a diminution in the percentage of lymphocytes, and relatively insignificant changes in the percentage of the other leukocytic elements. This indicates an absolute increase in the number of polymorphonuclear neutrophils, with the absolute number of lymphocytes in the circulating blood remaining the same. In two dogs a second injection of morphine at the time when the leukocytosis was marked, about four hours after the first injection, resulted in a further increase in the total number of white blood cells within an hour or so without any noticeable previous leukopenia. It is obvious that, in estimating the diagnostic value of a white blood cell count after the subcutaneous administration of morphine, allowance must be made for the effect of the drug on the count.

Ottenberg, R. HEREDITARY BLOOD QUALITIES. [Jour. of Immunology, September 1921, VI, No. 5. J. A. M. A.]

The work done by von Dungern and Hirschfeld and others on the agglutinogens A and B of red cells is the basis of Ottenberg's paper. The results of these investigations are applied to the question of disputed paternity. If the child's blood is the correct group for the alleged parents, then the child could be their offspring, not that it must of necessity be. But, on the other hand, if the child's group is wrong for the two asserted parents, then one can say with absolute certainty that the child must have a parent other than one of those asserted. The same evidence can be used, either to prove the illegitimacy of the offspring or (circumstances being reversed) to prove the innocence of a correspondent asserted to be the father of a given child. In infants and very young children the test can only be relied on if it shows definite group characteristics, which it does in the majority of cases. The test can be easily done with a few drops of blood obtained from a painless

prick with a small needle. Considering this, and the importance of the questions often at issue, it seems as though some legal means could be devised by which the persons concerned could be compelled to allow the examination at the hands of a representative of the court.

Lemoine. NUCLEINATE OF MANGANESE FOR TREATMENT OF ANEMIA. [Bull. Soc. de Thér, November 1920.]

Lemoine speaks of the work of Hannon and Pétrequin on the therapeutical value of manganese; both of these writers had emphasized its value as a tonic, and Pétrequin had even drawn a clinical distinction between chlorosis due to lack of iron, and that due to lack of manganese. Lemoine has employed nucleinate of manganese in cases of anemia and debility due to acute infections or neurasthenia, and has observed subsequent regeneration of the red cells and increase of hemoglobin.

Silvestri, S. SUGAR CONTENT OF THE BLOOD. [Policlinico, August 23, 1920.]

This is a review of the last few years on this subject. The behavior of the blood sugar in various diseases and especially with endocrine upset is discussed and in conclusion the statement is made that all the data presented need confirmation by further research before decisive conclusions can be drawn.

Mazzocco, P. CALCIUM IN THE BLOOD OF DIFFERENT SPECIES. [Revista de la Asoc. Méd., Argentina, August 1921, XXXV, No. 202.]

This technic paper deals with a simplified method for determining the calcium content of the blood, and the author also tabulates his findings in man and dogs, cats, rabbits, rats, fowls, goats, sheep and cattle under the technical conditions he outlines. They show that the calcium content of the blood corpuscles and of the plasma is the same for the same species, and about the same in the plasma or serum of the same animal. The average for men was 7.15 mg. per hundred c.c. of whole blood; 9.34 for the plasma and 1.23 for the corpuscles. The average for the whole blood in rats was 6.77; in rabbits, 8.43; in guinea-pigs, 6.02, and in cattle, 6.43.

Campbell, H. BLOOD AND NERVOUS DISEASE. [Lancet, 1921.]

In this paper the author insists upon the important part played by the blood in the genesis of the neuropsychoses. He discusses the influence of the plasmic environment upon the evolution of the neuron and shows that abnormal development of the nervous system induced through the plasma may be due to inborn or acquired defects of the plasma and that thus it influences both sensations and emotions. A person's temperament may be defined as the sum total of his emotional dispositions. What may be termed the habitual constitution of the blood is peculiar for each individual, and is largely responsible for the feeling note of each. There is little doubt that the difference of the feeling note of

different persons is due to differences in blood constitution. On the same lines racial temperaments may be explained. The writer says he does not contend that psychic factors, factors making a direct appeal, take no part in their causation, nor that psychic means are wholly unavailing in their treatment, but he does contend that psychic treatment is important to alter the emotional state which is the essential etiological factor in the more malignant forms of these disorders—those that break out in a favorable environment, for no mental treatment is capable of rectifying the peculiar condition of the blood which is responsible for it. This can only be done by material means.

Gunderson, A. H. BASAL METABOLISM IN MYELOGENOUS LEUKEMIA. [Boston Med. and Surg. Journ., December 29, 1921, CLXXXV, No. 26.]

A series of assumptions based upon the chemical technic of the basal metabolic apparatus. In nineteen cases his figures seem to indicate that the basal metabolism in myelogenous leukemia bears a relation particularly to the number of immature white cells in the blood stream, regardless of the total leukocytosis. His figures point to the idea that the highest values for the basal metabolism are usually found in cases with very high white counts and many myelocytes, or in cases showing high percentages of myeloblasts. Both of these findings signify great activity of the leukopoietic tissue, and the basal metabolism determinations may be utilized to check up this activity in some form of measurement.

Mazzocco and Morôn. CALCIUM IN THE BLOOD OF THE PREGNANT. [Revista de la Asoc. Méd., Argentina, August 1921, XXXV, No. 202.]

This is a study on the total amounts of calcium found in the blood. The figures are tabulated from 56 women, most of them pregnant. The range in the whole blood was from 7.80 to 9.26, the lower figures being in the pregnant or after delivery, showing a loss of total calcium during gestation. Connection between the vomiting, albuminuria or gastralgia of pregnancy and the calcium content of the blood could not be established.

Zadek, I. PERNICIOUS ANEMIA NOT AN INDEPENDENT DISEASE. [Sch. med. Woch., November 24, 1921, LI, No. 47.]

In this ingenious set of observations the author trephined the tibia and scooped out a little of the marrow under local and mild general anesthesia. This procedure showed practically normal conditions in the bone marrow during periods of remission of the symptoms in eight patients with pernicious anemia. The blood picture varied in the same way. He assumes that pernicious anemia is not a specific primary disease of the bone marrow. It is induced by some other intercurrent factor of which he can only think in terms of toxemia.

BOOK REVIEWS

Wilbrand, H., u. Saenger, A. DIE NEUROLOGIE DES AUGES. Siebenter Band. DIE ERKRANKUNGEN DER SEHBAHN VOM TRACTUS BIS IN DEN CORTEX. [J. F. Bergmann, Wiesbaden.]

This important monograph appeared in 1917 during the war, and has only just come to the reviewer's desk. Its importance demands a notice, although an adequate review is out of the question by reason of its mass of detail and its exhaustive nature. It is a review in itself of the entire world's literature up to 1917. Twelve hundred titles are given in the bibliography and in its 600 pages these are all subjected to minute and painstaking analyses.

Affections of the optic pathways from the tractus to the calcarine cortex are exhaustively described and minutely differentiated.

The reviewer can but add that this is the most outstanding meritorious and authentic presentation of the problems to date. No worker in the neurological field can neglect it.

Peritz, G. EINFÜHRUNG IN DIE KLINIK DER INNEREN SEKRETION. [S. Karger, Berlin.]

Perhaps no single branch of medical thought has been so ardently activated in the past five years as that of endocrinology. Ponce de Léon in his search for the Fountain of Youth; Brown Séquard, with his testicular extracts, embarked on a similar quest, and now the modern searchers of hormone activity—these are but links in the chain of man's eternal bondage—the combat with the forces of dissolution and death.

A place, a thing, an enzyme, each in its temporal setting are evoked to answer the riddle of the Sphinx. Peritz, however, sets himself no large task. His is a purely practical series of issues. He gives us an "Introduction to the Clinical Study of the Internal Secretions," in which he gathers in a practical manner the chief outstanding features of general endocrinological knowledge. Here is a small, compact manual for the busy practitioner. Here are assembled the essential crystallizations of opinion and the main outlines of present-day formulations concerning the endocrines. A thoroughly practical and useful volume of empirical data.

Sidis, Boris. NERVOUS ILLS, THEIR CAUSE AND CURE. [Richard Badger, Boston.]

After an abortive attempt to exorcise his freudophobia the author in his introduction raves about the mediocrity, the vulgarity, the lack of culture and of understanding of everybody else excepting himself. "Psychoanalysis needs a Voltaire, a Molière or a Swift"! Why

should it when the "world has a Sidis"! Behold "I have come to enlighten the world." How does he do it?

Sidis first starts to tell us that "throughout all animal creation one important purpose runs, and that is the preservation of life." He foams at the mouth when he even comes within the polluting presence of anyone who would suggest that even the word he uses in this ponderous bit of flapdoodle, "création," is necessary, not only for Sidis to form a sentence which has a word of truth in it, or for life to exist at all. Where does life come from if it is not by some "creative," *i.e.*, "sex" process. But Sidis is so pure, so above the vulgar, mediocre herd, that "sex" is nonexistent. He must be a product of "parthenogenesis," one of Loeb's chemically conceived embryos. At least on such hypothesis can we explain the lack of anything real or inspiring in his numerous other writings, or in this present very stupid book. "The aim of life is the individual. The species don't count." This is another of those brilliant *ipse dixit*s with which the book is sparsely punctuated, interspersed with verbigerous reiterations of the same thought stated in direct, indirect, infinitive, subjunctive, or interrogative clauses.

The book is nothing but a series of reiterated statements that the fear instinct is the fear of the loss of the instinct of self-preservation. Fear is Fear and now you have the great secret. Get rid of Fear and there will be no nervous ills. How can one get rid of Fear? "Why come to me and let me put you in a hypnoidal state" and joy cometh in the morning. We suspect there is more autobiography in Sidis' statements about Fear than anything else. He expresses his own fears and phobias so pointedly and vociferously in his introduction and seems to have so little insight into them, saying "everybody is out of step save me," that the book can be recommended to one who would seek to learn why Sidis has done so little for psychopathology and remained where he was 20 years ago and is still mouthing the same old formulae over and over again.

Kaup, J. KONSTITUTION UND UMWELT IM LEHRLINGSALTER.
[J. F. Lehmanns, Verlag, München.]

M. v. Gruber and J. Kaup are members of the Munich University faculty specializing in social hygiene and this and a companion volume appear as "Contributions from the Hygienic Institute of Munich."

It records a series of observations chiefly concerning factors of bodily growth in the young men of Munich, chiefly engaged in work. The object is chiefly directed to bringing into the foreground such constitutional factors as accompany disabling diseases, and to learn methods of early recognition and competent treatment.

There are studied the relationships between the calling or trade and the development of the individual. Thus they indicate the tendency, at the puberty period, of overlength and underbreadth growth in boys in mercantile life. The same influence but to a less degree is seen in machinists. In keywrights normal length and subnormal breadth, etc., etc., the details must be consulted in order to make these conclusions understandable. From these studies, which in Volume II

deal exclusively with machinists, keywrights and forge workers, a large number of valuable principles are evolved looking forward to making the working man a healthier and happier human being.

Hun, Henry. AN ATLAS OF THE DIFFERENTIAL DIAGNOSIS OF THE DISEASES OF THE NERVOUS SYSTEM. [Analytical and logical Neurological Charts. Third Revised and Enlarged Edition. The Southworth Company, Troy, New York.]

The author is to be congratulated upon the success of this novel undertaking. Dr. Hun's book was a distinct novelty. It has proved itself a useful one as well, for two editions of 5,000 copies each have been sold. For a work on neurology this is a record. There are many reasons why this should be so. Chiefly concerned are the great care and accuracy used in the drawing up of the diagnostic charts. The physician is so often confronted by some obvious disturbance. The patient limps, or has pain, or comes to the doctor with a disability of one or more of the muscles, or the cranial nerves, or of some annoying fear or peculiar idea. What is it? is the first question! Then, What can I do for it? Dr. Hun makes a truly splendid effort to aid the physician, neurologist or otherwise to get close to a practical problem, "In what category does this fall?" How can the facts be assembled by means of nosological conceptions? No matter how much many up-to-date thinkers spurn to attach labels to things, some sort of working principle of classification is essential. And this work supplies in good measure this very laudable purpose. It aids the inquirer to narrow down his objective. The only thing needed to make the book complete would be a reasonably carefully selected bibliography of the various "disease types" to which the inquirer could be directed to reliable textbook summaries and their authoritative monographic discussions of the various syndromes.

Rutgers, J. DAS SEXUALLEBEN IN SEINER BIOLOGISCHEN BEDEUTUNG. [Verlag. R. A. Giesecke, Dresden.]

In the author's subtitle the sexual life is considered as the "chief factor of the life energy for male and female in the plant and animal world." The hypocrite, the coward, and the impotent extol the principle of "self-preservation" as the main instinct of life. The honest, the courageous and the truly creative people of the world have no fear of the sex instinct. They know it, they face it, and they seek honestly, courageously and purposively to direct it to useful ends in society. They are able to distinguish between the pornographic, the obscene, and the immoral, whereas, for the most part, the sex reformers, the prohibitionists, the anti- this anti- that are suffering from their own psychopathies and needs must attack, in others, the difficulties most subdued in themselves.

Rochefoucauld has said in his inimitable epigrammatic phrase, "there is no vice half as bad as the means we take to conceal it," and the almost overwhelming avalanche of "sex" literature of the past ten years is but an indication of the revolt that a healthy instinct has felt towards the "puritanical" efforts of concealing vicious

impulses which do infinitely more harm under cover than they can possibly do when faced in the open.

Only a "fathead" can refuse to see that "sex bootleggers" would naturally take advantage of the movement and attempt to put over spurious brands, but even these are robbed of their evil effects in the open market.

The present volume belongs to the "real stuff." The author has for a number of years devoted earnest thought to the problems of human contacts. As a practising physician in Rotterdam he has met with and handled without prudery the complicated problems of marriage and the rearing of families. These social expressions of the sex instinct, with their countless difficulties, he has endeavored to understand and in the present excellent treatise has made a praiseworthy effort to set forth the underlying biological principles which will tend towards health and happiness in the body social.

We hold it unnecessary to outline his program. It is founded on structural facts, on sound physiological formulations, and on the best of ethical insight. What more can be said of any book that attempts to help the ignorance that prohibitive psychopathic influences seek to impose upon others what they have been unable to solve within themselves.

Narayana, Ram. *THE DREAM PROBLEM.* Vol. II, Part 1. [Practical Medicine, Delhi, India.]

The author here continues his studies of the dream phenomena chiefly through means of a questionnaire of what other people think about dreams rather than an investigation of the problem itself.

After an interesting introduction which points out certain resemblances and certain differences in Eastern and Western philosophies—more matters of terminology than real differences, after all—the main body of the work prints the answers of various students of philosophy to the author's fourteen points.

While interesting it is hardly of much service, for with but few exceptions there is no evidence in the answers that the writers have had any actual experience with psychiatric problems. Lacking this experience the answers are for the most part sterile, academic discussions of metaphysical principles instead of analytic investigation of biological processes.

Cornelius, A. *PERIPHERIE UND CENTRUM.* [Georg Thieme, Leipzig.]

This small brochure comes as a sincere protest against a one-sided vision of nervous ills by one who has devoted many years to the treatment of these ailments by many measures especially directed to peripheral forms of stimulation. It consists of several lectures given by him to his students at a "Lehranstalt für Nervenpunktmassage."

In his opening lecture he contrasts the points of view of those who adhere to a pure psychical origin for nervous disorders and those who advocate their peripheral origin, and takes up the general issues that flow from the claims that hydrotherapy, electrotherapy, massage, etc., are in reality modified forms of psychotherapy and the thera-

peutic results that may be claimed for these methods should be attributed to their central, *i.e.*, psychical influence. He grants that a certain modicum of these claims is justified but in view of the highly complicated necessities which result from a purely psychical approach, he argues, taking in mind the intelligence, the economic situation and other practical issues, that the peripheral modes of attack are not only justified but are really better therapeutics. In view of the difficulties the reviewer is inclined to believe he has established his point.

De Montet, Ch., et Bersot, H. PSYCHOLOGIE ET DÉVELOPPEMENT DE L'ENFANCE A LA VIEILLESSE. [Ernest Bircher, Berne, Switzerland.].

Had Binet ever contemplated the stir which his early researches on "intelligence" would have created, it is not impossible he would never have dared publish them. In fact one can see him writhing in his grave as the weight of the mass of literature on the subject bears now upon one, now upon another aspect of his foundations. For thousands of tons of this learning he is made responsible.

This contribution is one of the many which have been provoked by this opening. In one sense the present inquiry is quite unique. The authors propounded a questionnaire, "*What rôle does money play in life?*" This was submitted to children, to adolescents, to adults, and to the aged. They have collected the answers, analyzed them, and sought to show how, as age advances, the ideas have modified and evolved from the most simplistic and the most primitive to the most complicated and developed.

On the basis of these stages of development the authors have sought to show the various stages of mental evolution, their character and the general laws underlying this evolution of human thought.

Further, they have endeavored to develop a critical logic concerning the advance of knowledge as it frees itself from the purely subjective aspects of uncritical infantile ideas to the more objective values of social operations.

It can be most heartily recommended to students of psychology, psychiatry and sociology.

Rank, Otto. DER MYTHUS VON DER GEBURT DES HELDEN. Zweite wesentliche erweiterte Auflage. [Franz Deuticke, Leipzig und Wien.].

The first edition of this stimulating work appeared in 1908. This was translated in 1913 into English under the title "The Myth of the Birth of the Hero," and the ideas of the author on the development of myths, and the application of such concepts to a deeper understanding of unconscious motives in human behavior, made more available.

In this second edition the author sketches the further developments which psychoanalytic studies have made available in the substantiation of the generalizations advanced.

Thus there has come about both a better understanding of the significance of the psychical structure of myths in general and also a

deeper and more valuable insight into the part that such symbolizations play in the development of the human psyche and in the cultural evolution of social structures.

To have done this is no mean achievement and the author is to be congratulated upon his product. His readers are fortunate in having so able a portrayal of most intrinsic and valuable factors in human evolution which all too frequently are viewed from very superficial standpoints. This work is a wholesome corrective to much peurile research into human motivation.

Breuer, Jos., Freud, S. STUDIEN UEBER HYSTERIE. Vierte, unveränderte Auflage. [Franz Deuticke, Leipzig u. Wien.]

In spite of the fact that this collection of studies has been before the public for nearly thirty years and has been translated into a number of foreign tongues its fundamental value has not been lost through later researches and it is still demanded. Hence this fourth edition, which is a reprint of the first. Such a history is almost unexampled in modern medical literature and argues for the high scientific value of this pioneer work.

Pappenheim, Martin. DIE LUMBALPUNKTION. [Rikola Verlag, Wien, Leipzig, München.]

It is the special advantage of this monograph of 172 pages to have included in clear, terse and yet complete form a masterly survey of the available knowledge concerning lumbar puncture. It is thoroughly up to date, omits nothing of importance and yet saves the time and patience of the reader by reason of its direct and thorough analysis of the various questions involved. It is not a literary compilation, it comes from actual experience and a wide acquaintance with the work of others engaged in this field.

Wuth, Otto. UNTERSUCHUNGEN UEBER DIE KOERPERLICHE STÖRUNGEN BEI GEISTESKRANKHEITEN. [Julius Springer, Berlin.]

Since the days of Hippocrates the somatic accompaniments of mental disease have been recorded in increasing proportions. In recent years these have been heaped up in bewildering complexity from the point of view, or with the hope that such structural changes may afford an insight into the nature of the psychoses.

With the advent of biochemical research the efforts to chase down the intangible have been redoubled, and in the secret complexities of protoplasmic structure and reaction the endeavor to track the psyche to its lair have been essayed. From time to time there have been those who have seen in such structural modifications effect phenomena rather than causal interpretations. These have been rare, however, and have usually enjoyed the fate of all minority thinkers.

In spite of every variety of disharmony in the "findings" from the static somatic viewpoint the research goes on. This is eminently fitting and proper, even if it be admitted that function always pre-

cedes structure, particularly in evolution. May not structure precede function in devolution?

The present contribution takes us into the laboratory of the Research Institute of Munich. Here are presented researches upon the serum albumin contents, the albumin quotients, the blood coagulation times, the antitryptic titer, the precipitation of the blood cells, the morphology of the blood, the blood sugar content, the fixed nitrogen, the creatinin, the uric acid content of the blood. These are investigated in the manic-depressive psychoses, dementia precox, epilepsy, paresis and convulsive states.

That the research is sound no one can doubt. Where it leads us must be left to future studies. All that can be done here is to call attention to the research and to commend it on its own foundations.

Isola, Domenico. GLI AUTOMATISMI MIDOLLARI DAL PUNTO DI VISTA FISIOPATOLOGICO E CLINICO. [Barabino e Graeve, Genoa.]

In the past decade the study of spinal cord pathology has undergone many modifications and new orientations have opened up many seductive lines of investigation with consequent definite advances in our knowledge of spinal physiology and pathology.

The earlier work of Goltz and Freusberg, with the score of physiological researches of Sherrington and the more recent pathological studies of the French school have brought our knowledge of spinal segmental autonomy into clear light and given to contemporary neurology solid foundations for practical applications.

Isola has here contributed to these discussions a very laudable monograph. In his first chapter he gives a clear and concise résumé of the chief historical landmarks in the study of medullary automatisms from Prochaska's (1784) frog reflexes to the valuable researches of Magnus and Klein, Prochaska, Goetz, Singer, Baglioni, Clementi, Sherrington, Brondgeest, Magnus and Klein. These are the workers here briefly noted and their results logically set forth for the animal phylum. A second short chapter carries these studies into human pathology. This leads naturally into the study of synergistic reflex phenomena and their relations to spinal automatisms and then to various synkinetic phenomena; those of the bladder and genital apparatus occupying a special chapter (V).

A second part of the book deals with the author's own researches. Pigeons are experimentally studied; then ischemic and narcotic observations follow. Plantar reflexes in epilepsy are recorded in a later chapter. "Clinical material" finishes up part two. Part three is interpretative. Muscular tonus, contractures, Bastian's law, Babinski's reflexes, Marie and Foix's defensive reflexes, these are discussed in turn. Finally the author sums up the clinical importance of the findings discussed (pages 204, 205). The absence of any mention of Head and Riddoch's work is a definite omission (they are mentioned only in the fair bibliography from Italian abstract sources only; the originals are not quoted). Notwithstanding this and other notable omissions the study is to be recommended.

Hollander, Bernard. THE PSYCHOLOGY OF MISCONDUCT, VICE AND CRIME. [The Macmillan Company.]

Some years ago a man of literary distinction wrote the "Idle Thoughts of an Idle Fellow." In spite of its deprecatory title the thoughts expressed were neither "idle," and their charming and logical presentation showed they could never have been evolved by an "Idle Fellow."

As we have glanced over this small volume we have dubbed it in our mind "The Rambling Thoughts of a Scatterbrain." All sorts of things are set down with almost no logical development and with a woeful lack of insight or "critique." Although the author claims to follow the lead of the "New Psychology" and believes he has written a unique book, we find no evidence that he really knows anything about the "New Psychology," and as for his book being one of the first in its sphere, it may aptly be described in the language of the race track, "he also ran." Perhaps more aptly, "left at the post."

Notwithstanding pretentious but sloppy advocacy of the Macdougall "instinct" notions he soon wanders off into rambling anecdote, or jumbled dogmatisms, contradicting himself so often as to make the reviewer wonder if he is to be taken seriously at all. In a few places he quotes and misquotes in the same page—particularly when he would attempt to show his acquaintance with psycho-analytic theories. Here his superficiality would be annoying if it were not so ludicrous.

Surely a dangerous and inane book to have been put out by so responsible a publishing house.

Triscă, Petre. LA PROPHYLAXIE MENTALE EN FRANCE ET A L'ÉTRANGER. [A. Maloine et Fils, Paris.]

Mental hygiene has become a password and the gradual extension of the movement throughout the United States, France, Belgium and Switzerland is here told in a general manner.

Osty, Eugène. LA CONNAISSANCE SUPRA-NORMALE. ÉTUDE EXPÉRIMENTALE. [Felix Alcau, Paris, 1923.]

"We live on the surface of our being." This quotation from Wm. James is the "leit-motif" of this treatise, and, as such, is printed on the cover of this work. The author, who has contributed a study in "Lucidity and Intention" has "condensed" (?) in the volume before us of 388 pages, the "results of a dozen years of experimental study of the strange faculty which certain persons possess concerning things and persons under conditions in which their senses and their reason are totally unknown to them." The book is divided into four sections. In two of these the typical phenomena of this faculty are recorded. Their diversity and their nature are made available in print. A third part of the book elucidates the functional nature of these phenomena. A fourth seeks to ascertain the nonappreciated source of the phenomena. At the same

time the author sets up finally a defensive reaction in that he affects not to make an effort at their explanation but seeks to rest upon the "facts." Herein he quotes Claude Bernard "to speak of nature," and to add nothing to it.

The reviewer can claim only to be, in the language of American slang, a "hard boiled egg"—*i.e.*, a sophisticated resident of that western state whose slogan has come to be expressed in the pregnant phrase "show me." Not altogether something to be admired, but yet at the same time an advocate of a pragmatic philosophy that maintains that a principle which is claimed to be of signal service must in the end "deliver the goods." Supranormal intelligence is not denied. It is seen in every phase of life. It works, but it is devilishly normal. The vaunted possessors of the supranormal are usually such idiotic morons in almost every aspect of practical life that the self-same residents of "Missouri" look upon them with indulgent compassion and leave them to their illusions.

Autistic thinking—to use Bleuler's broad formulation, is a universal small coin of the populace. The "wise man" is in the minority. "He" profits from the credulity of the masses. From his point of view the masses are "insane." He really has the intuition of the supranormal. Those who think they have it, these are the deluded, the impotent, the *hope* of the morons.

The reviewer, as he reads this book, and is definitely acquainted with the *persons* who have expressed the beliefs that the author sets forth, cannot refrain from stating that in his experience, such individuals are engaged, either consciously or unconsciously (after a shrewd mixture of the two), in exploiting universal ignorance for their own advantage.

But there are other aspects of this general type of problem which the reading of this really interesting book raises. One looks in vain for the slightest indication of psychiatric knowledge or experience. Phenomena which are the every day commonplace in the psychiatrist's experience are dealt with in this type of literature as "supranormal." The psychiatrist acquainted with these psychological phenomena endeavors to trace them out of individual experience and has little trouble in understanding their significance for the most part. But the Oliver Lodges, the Conan Doyles and others, very admirable people they may be, show their colossal stupidity the minute they enter the psychiatric field with their physical or literary conceptions.

This book, like others of its kind, shows the same lack of insight into matters of psychological import. Anecdote is taken as observation, and numerous instances of psychopathological importance are judged from the most naïve autistic standpoints.

Hollos, St., u. Ferenczi, S. ZUR PSYCHOANALYSE DER PARALYTISCHEN GEISTESSTÖRUNG. [Internationaler psychoanalytischer Verlag, Leipzig, Wien.]

This monograph, small in size, 55 pages, is rich in content. It is written by two authors. Hollos contributes the clinical material with psychoanalytic comments. Ferenczi would generalize upon the

situation and show wherein this clinical material harmonizes with certain conceptions regarding the "Personality" concerning which he made most valuable contributions.

The general thesis is that in this disease, the organic substratum of which is definitely recognized, there is a gradual erosion of the personality, and that the mental symptoms become quite comprehensible in psychological terms through an application of psychoanalytic principles. This concept has already found place in American psychiatry (see White's *Outlines of Psychiatry*; Jelliffe and White, *Diseases of the Nervous System*) but it is more precisely outlined and conclusively demonstrated in the monograph here considered.

The various ideas of the paretic can be understood on the "wish fulfilment" basis. Various "delusions of grandeur" are shown to be compensatory for loss of function. Many perseveratory symptoms, especially those dealing with numbers, may often be run back to actual life experiences, such as the time of infection, the outbreak of the psychosis, etc. Very frequently the paretic refers to certain numbers as indicative of the time when the personality began to crumble. Nothing after that is real. Impotency symbols are richly elaborated in the mental symptomatology. Even the "increase in weight" in many paretics may be better understood in psychogenic terms as a narcissistic compensatory activity.

There has been a definite movement in American psychiatry sympathetic to the lines here laid down. White, Kempf, Nolan, Jelliffe, Clark, Brill and others have all supported the idea that the somatic pathology is not sufficient to envisage the whole situation and have contended that the psychological picture contains much to be elucidated. The psychoanalytic mode of approach is valuable to evaluate these psychological data. This monograph goes a long way to afford a solid platform for further investigation. The paretic becomes a highly valuable object lesson in the gradual peeling off of the integrative mechanisms which make up human personality. Through it we may enlarge our vision both as to synthesis and analysis of the Personality.

OBITUARY

WILLIAM THORBURN

Sir William Thorburn passed away in March, 1923, in the midst of an active career. Behind him were many years of important activity in anatomical research and practice in medicine and surgery, before him was still the prospect of greater opportunity in medical policy and hospital administration, in which he was engaged.

In all this work he manifested the qualities of clearness, accuracy and an intellectual honesty which formed no hasty judgments but relied only upon the largest assemblage of facts. The exercise of these qualities inspired reverent admiration and impressed his instruction indelibly upon those who came under its influence. These were the qualities which had marked his clinical and pathological investigations which he had carried out extensively from his earliest professional days. He published invaluable results of this work as early as 1889. He made detailed study of the paralyses and anesthesias associated with diseases and injuries of the spinal cord determining by wide observation the exact location of the lesions and by this correlation of the clinical symptoms with the definite seat of the injury he worked out for the first time the exact distribution of the spinal nerve roots. His Bradshaw lecture upon surgery of the spinal cord is a notable example of his scholarship.

During the war he was occupied in the neurological section of the Second Western General Hospital which he had organized. Here he manifested the same ability for administration and the absolute faithfulness to the details of his clinical work which were so truly a part of his nature. He was under heavy sorrow himself at this time; his third son was killed in service while his other two sons had died, one a few years before, the other just before the war began.

Thorburn was a man who held aloof in his private personality. He inspired great respect and impressed upon those with whom he worked a convincing power in regard to the work itself. But he did not invite too close friendship. The wide circle affected by his death bear testimony, however, to the esteem in which he was held.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

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ORIGINAL ARTICLES

MYELITIS FOLLOWING GENITOURINARY INFECTION *

BY FRED P. CURRIER, B.S., M.D.

GRAND RAPIDS, MICHIGAN

Attention is called to a neurological condition which occasionally follows infections of the genitourinary tract. This condition occurs in cases where no operative procedure has been attempted, but more often after some operation.

In the *Medizinische Wochenschrift* of July 2, 1920, Foerster reports three cases in which the patients were suffering from cystitis, with pyelitis as an accompanying infection in the third case of series. During the course of the infection, there appeared within the period of a few weeks to a year, symptoms involving the nervous system.

The symptoms and signs were briefly as follows: All three patients had pains in the lower extremities and about the hips. Pain in the arms and through the breathing muscles was also noted in one case. Shortly after or during this period of pain, the patients noticed gradual weakness of the parts involved so that for a time walking was impossible. In one case the arms were paralyzed. The knee reflexes were increased in all three cases. The umbilical reflex was absent in one case. He found at times hyperesthesia and at other times hypesthesia. No other tests were mentioned except that he states the electric reactions were not taken.

According to Foerster, cases of urinary paraplegia have been reported as early as 1865 by Ernest Leyden, and at later dates by other writers among whom were Stanley, Graves, Stokes, Friedberg, Brown-Séquard, Remak, and Kussmaul. Two of Leyden's cases in

* From the Neurology Clinic, University of Michigan, Ann Arbor, Mich.

which the breathing muscles were involved came to autopsy. Macroscopically, the lumbar cord showed some softening and on microscopic examination, this was found to be present in the whole cord. From the lumbar to the lower thoracic region, fat bodies and corpora amylacea were found between the nerve fibers. The nerve fibers themselves showed atrophy, degeneration, and in some places a certain amount of hypertrophy. From his findings he considered it a myelitis, the ascending infection having traveled along the nerves which supplied the bladder.

Oppenheim in his observations was not sure whether he was dealing with an acute infection of the spinal cord which came as a result of transmission by the lymph channels or blood stream, or whether the infection came as a result of a direct cellulitis, or finally, whether it was an ascending infection which traveled along the nerve trunks from the bladder to the cord.

In the *British Medical Journal* of January, 1922, William Thorburn, in a paper entitled, "Diagnosis and Treatment of Intrathecal Tumors of the Spinal Cord," discusses somewhat at length cases of bladder infection similar to the above. To quote in part, he says: "We have a clinical picture which I may describe as the blurred image of an intrathecal tumor. Anesthesia could not be recorded in diagrams as it was vague and changeful with a tendency to extend upwards. Paraplegia was steadily increasing in intensity. The reflexes were those of a transverse lesion except for the plantar reaction (plantar irritation produced flexion and knee and ankle jerks were increased). There was no longer any pain and pain had always been of the slightest. Such a condition reminds us at once of the cases described by Horsley as chronic spinal meningitis and by Spiller as circumscribed serous spinal meningitis.

Operating on 21 cases of this type which had been originally regarded as tumors, Horsley found excess of cerebrospinal fluid, thickening of the arachnoid, matting of nerve roots, and compression of the cord. He opened the dura mater, irrigated with strong solutions of mercuric chlorid and left the theca open for drainage.

"I hold that there is a strong probability that many cases of transverse myelitis may be arrested and cured by incision and drainage of the dura mater—a possibility fully in accord with the view that such myelitis is often due to infection spreading along the spinal nerves and then necessarily crossing the meninges and intradural space before the cord is attacked. I may add that I think the infections usually derive from the urinary organs—a view in accord with the cases which I have myself seen, with the tendency to trans-

verse myelitis to attack the levels connected with kidneys and with fully recognized tendency of the kidney itself to collect and harbor organisms of all types."

Three cases of this type have been seen in the Neurology clinic in the University of Michigan in eight months.

Case I: A bricklayer, age 72, was referred to the neurological department, his chief complaint being, difficulty in walking and inability to raise the toes of both feet.

The family history was negative for nervous or mental diseases. He had the usual children's diseases, with good recovery. He had gonorrhea at 21 years of age, complicated by stricture. A number of reinfections occurred later. Lues was denied.

He came to the hospital on April 26, 1921, for urethral stricture operation. Attempts were made to dilate the stricture about May 1, 1921. Operative measures followed a few days later. Within a period of four days, he had pain in the right hip region and extending along the course of the right sciatic nerve. This lasted for a few hours and he then noticed, coming on gradually, an inability to raise the toes of the right foot, and still later, a difficulty in dorsal flexion of the foot. About the same time or a little later, he had similar difficulty in movements of the left foot. No pain preceded the paralysis. He was being treated at the same time for a stricture of the esophagus, which had been diagnosed carcinoma, and apparently had nothing to do with the symptoms under discussion.

At the time of the examination, the patient was fairly well nourished and walked with a steppage gait. He had no Romberg, no speech defect, no memory defect and he answered questions promptly and intelligently. There were no atrophies or deformities, no intention tremor and no ataxia. Facial and tongue movements were normal. The examination of the eyes was negative, all movements and reflexes being normal. Biceps, triceps and knee reflexes were all present, prompt and equal. The Achilles reflex was not obtained on either side. Plantar irritation produced flexion of the toes. He was unable to dorsally flex the feet at the ankle joints, or to extend the toes.

The sensation for pain, heat and cold, light touch, and motion and position were all normal. Vibratory sense was lost in the dorsal aspect of both feet and midway to knee on the left tibia.

The physical examination was practically negative except for signs of an emphysematous chest. His blood pressure was systolic 110 and diastolic 70. The blood examination, including the Wassermann, was negative. The spinal fluid examination, including the Wassermann, the goldsol, mastic, pressure, cell count, carbolic reaction, and sugar reduction was negative. The Nonne-Apelt, phase one, showed a faint trace at the line of demarcation and phase two showed slight opalescence.

The urine examination was negative except for occasional white cells and epithelial cells and a positive bacteriological culture for colon bacillus.

This patient made a complete recovery from the signs of paraplegia within five months after its onset. He died later on from the carcinoma of the esophagus and the spinal cord was obtained for pathological examination. The results of the examination by Doctor A. S. Warthin were as follows: "All sections show moderately, uniformly, diffuse postmortem myelinosis. Meningeal vessels are congested and many of the smaller arterioles show a rather marked hyaline sclerosis. Likewise, small capillaries within the cord show fibrosis and hyaline change. Some nerve cells show pigmentation. There are no inflammatory reactions, no active infiltration, no tract degeneration. Nerve roots show no pathological change except for sclerosis of some of the vessels. The only pathological changes are those of senility."

Case II: Patient was referred by the genitourinary surgery department. He was a physician, age 77, who entered the Hospital on August 2, 1921, complaining of frequency of urination, day and night.

His family history was negative. The past history was negative except for typhoid at 23, a hemorrhoid operation 17 years ago with good recovery, and influenza one year ago with good recovery.

Five years before he came to the hospital he began having frequency of urination. His condition gradually became worse so that during the last year his frequency during the night was every two or three hours. He also had cramping sensations at the beginning of urination and attempts to pass the catheter past the prostate were unsuccessful.

His physical examination was practically negative except for the rectal findings which showed a firm, enlarged prostate, smooth and not tender. The urine examination, as in the first case, showed a trace of albumin and the sediment contained many cocci and colon bacilli, and pus cells.

On October 16, 1921, a prostatectomy was done by Doctor Hugh Cabot. The following three days after the operation, his morning temperature averaged 98 degrees and the afternoon temperature 100.5 degrees. On the fourth day he had a chill and his temperature went up to 102 degrees. Following this, he noticed for the first time, a slight numbness in his right foot. There had been no pain in the affected part at any time. His temperature gradually receded and November 1, 1921, it was normal. His pulse rate averaged 90 and the respirations 24. On October 20th, or at about the same time the numbness occurred, he noticed a foot drop on the right side.

A neurological examination was made on October 26, 1921. There was a marked arcus senilis, and the pupils reacted sluggishly to both light and accommodation. The upper extremities were normal including the biceps and triceps reflexes. The left lower extremity seemed to be normal in every respect. He was unable to dorsal flex the right ankle, and had apparent paralysis of peroneal and tibial groups of muscles. He could not extend the right great toe, but could flex the toes and the right ankle normally. His knee jerks

and left Achilles reflex were normal but the right Achilles reflex was not obtained. Plantar irritation caused flexion of the toes. There was no loss of the sense of motion and position. Tactile, pain, and temperature sense were normal, but the vibratory sense was somewhat diminished on the right ankle joint. There was no atrophies or permanent deformities. There were no vasomotor changes.

He was reexamined on November 18, 1921, and complained of numbness and swollen feeling in the left leg. The symptoms in the right foot had gradually improved. The sense of motion and of position were impaired in the toes of the left foot and the left knee and Achilles jerks were absent. Vibratory sense in the right ankle was not entirely lost.

Case III: On November 7, 1921, a housewife, age 35, was referred to the Neurology Clinic from the Surgery Department, complaining of pain and "drawing up of the legs."

Her family, menstrual and marital history were all negative. She had the usual children's diseases with good recovery. In January, 1919, she had an appendectomy, anterior shortening and dilation and curettage with relief from previous symptoms of mucus colitis. Since her entrance in the University Hospital on April 26, 1920, when her symptoms of mucus colitis were practically the same as three years ago, she has had six operations, the last one being for complete removal of all of the descending colon. The first operation in this hospital was for the removal of an indurated mass along the rectum and the other operations followed as a result of complications.

The pathological report by Doctor A. S. Warthin on the removed colon on July 28, 1921, was as follows: "Chronic hypertrophic colitis with multiple ulcers. Marked hyperplasia of all the lymphoid tissue. No signs of syphilis or other specific infection. No tubercles or definite neoplasma. Colon is surrounded by an almost continuous ring of hyperplastic germ centers. The process looks more essentially inflammatory than neoplastic."

The present trouble began after the last operation on July 27, 1921, when the patient received daily bladder irrigations for one month. During a part of that time she was incontinent and during the month of September, 1921, she complained of severe pain over the bladder region and a constant desire to urinate. There was considerable distress following urination. The bladder symptoms lasted for about a month and she then began to have severe pain in the shoulder region, arms, and breathing muscles. As the pain in these regions subsided, she noticed for the first time, pain in the thighs, legs and feet and she complained also of a burning sensation in the feet. At the time of this examination (November 11, 1921), she still complained of pains in the toes and plantar surfaces of the feet, and for the past two weeks, she had a gradual increasing weakness and contractures of both lower extremities.

Her general physical examination was negative. Her blood examination at the time of her entrance showed a leucocytosis of 23,000 and the Wassermann on the blood was negative. The urine was normal except for the finding of a few pus cells to the high power

field. The stools at her first entrance contained macro- and microscopic blood but no amœbæ or eggs were seen.

At the time of the examination, the patient was lying in bed and apparently not in pain. She was mentally normal. There was no facial palsy and the tongue movements were normal. The eye examination was negative. There were no motor disturbances in the upper extremity and the biceps and triceps reflexes were normal. Her legs were somewhat wasted and her voluntary movements were weak and slow in all directions. The knee and Achilles jerks were absent and plantar irritation produced no movement of the toes. The sense of motion and position and the vibratory sense was lost while pain and tactile sense were preserved. There was some anesthesia of the conjunctivæ and pinpoint was felt plainer on the right side than on the left.

In reviewing these three cases, attention is first called to the fact that all three patients had an infection of the genitourinary tract and second that they developed symptoms involving the nervous system after operative procedures along the tract. In the first two cases, the symptoms appeared within a few days after operation, while in the third case, they came on after the patient had been taking daily bladder irrigations for a period of two months.

Although no definite proof can be offered as to the cause or mode of transmission of the infection, it seems probable that it travels along the nerves supplying the genitourinary organs to the meninges of the cord and later involves the cord itself. The sudden appearance of the pain in the legs in the first case and over the bladder region in the third case, localize the inflammatory condition of the meninges to the sacral and lumbar region of the cord. Inasmuch as this is approximately the same region from which the nerve supply to the genitourinary organs is derived, we assume that the infection traveled along the nerves directly to that part of the cord. The negative spinal fluid findings in the first case, however, were of no particular value in proving that an infection had or had not existed, because the fluid was examined too long after the initial symptoms.

The slight amount of pain and paralysis, the tendency of the patients to recover, and the negative pathological examination in the first case, lead one to believe that the infection is of a mild type.

The writer wishes to thank Dr. C. C. Camp for the privilege of reporting these cases.

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A SURVEY OF ROUTINE URINARY FINDINGS IN THE PSYCHONEUROSES

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The question as to whether certain morbid mental or general neurotic states are of a purely functional origin or whether the causal factors relate to organic pathology is still regarded as an open one. Evidence pointing in one direction or the other is scanty, and additional facts tending to illumine the subject should be brought forth. Histoneuropathological studies have been carried on lately which indicate the presence of anatomical deviations in certain neuropsychiatric conditions resulting in death. Chemical investigations of one or two blood constituents in some of the neuroses have likewise been carried on more or less systematically in a few instances. But systematic studies of the urinary constituents, especially of those routinely looked for in the everyday laboratory urinalysis, are conspicuously absent.

The present paper, as the title indicates, represents a survey of routine urinary findings in a large number of cases admitted to the U. S. Veterans' Hospital No. 37, at Waukesha, Wisconsin, during the calendar year 1921. The cases were classified according to the diagnoses found in the histories when they were reviewed. This was done in the early months of 1922, after most of the cases had been presented before the staff conferences, and the diagnoses thoroughly discussed. Tentative diagnoses were comparatively few.

The survey was made by the writer more from the point of view of a laboratorian, than of a clinician. A urine entirely free from laboratory findings was considered normal, and any deviation from this normal, however insignificant from a clinical point of view, was accounted for. That such a viewpoint does not exaggerate the pathology involved may be easily determined from a review of the literature on urinary findings. Thus, E. O. Smith (Urology and the General Practitioner, J. A. M. A. 77:11, 833-834, September, 1921) states that "pus and blood are not often found in an authentic specimen of urine unless there is some pathologic condition present in the urogenital tract." J. R. Caulk (Factors Which Influence

Results and Mortality Rate in Kidney Surgery, *J. A. M. A.*, 77:11, 843-848, September, 1921) emphatically states that the disregard of the occasional pus cell has had a powerful influence in delaying early investigation of kidney lesions, causing a high death rate of late infection among these cases. Emerson (The Acute Element in the Chronic Nephritis, *J. A. M. A.*, 77:10, 745-749, September 3, 1921) is of the opinion that "the more normal the kidney before the disturbance, the more spectacular will the urine changes be. This—he states—explains also why the man who for years has suffered from chronic interstitial nephritis may, a week or two before his death, void a urine practically normal, which at death may contain only a trace of albumin and a few hyaline casts." Numerous citations can be given which would lend support to the viewpoint taken by the writer with regard to laboratory urinary determinations.

The following findings were reported, classified, and studied: Specific Gravity, Color, Appearance, Reaction, Albumin, Sugar, Indican, Bile, Casts, Cylindroids, Pus, Mucus, Blood Cells, Spermatozoa, and a few others. The average specific gravity values were given for each group. Only two colors were distinguished in this study, the yellow, and the amber. Likewise only two groups were recognized so far as appearance was concerned, the clear, and the turbid. Three groups included the reaction, acid, neutral, and alkaline. Since the latter was found in only 1 per cent of the cases, it was left out of discussion in the following pages.

The urines were voided by the patients between 7 and 9 A.M. and were analyzed between 9 and 12 A.M. The methods employed in the analyses were the usual routine laboratory methods, such as are described in any book on laboratory diagnosis. Although the kinds of casts found in the urines were recorded, their individual significance has not been dwelt upon in this paper. Similarly the types of renal epithelia were left out of consideration here. These points will be discussed in a forthcoming publication.

Histories of 335 cases, with a total of 827 urines, were reviewed and classified. The groups were as follows:

Hysteria, 107 cases; neurasthenia, 70 cases; anxiety neurosis, 37; traumatic neurosis, 14; hypochondriasis, 14; dementia precox, 8 cases; constitutional psychopathic personalities, 28; drug addiction, 4; mental deficiency, 10; organic involvements, 51 cases.

The urinary findings were first studied in the 335 cases as belonging to one group. The lowest, average, and highest specific gravities found were, respectively, 1001, 1022, and 1050. Six hundred and

two of the urines, or 73.0 per cent, were of a yellow color, and 169, or 27.0 per cent, were of an amber shade. The average of the specific gravities of the yellow urines was 1022, and that of the amber 1028. This supports the prevailing opinion that, generally speaking, the darker urines possess a higher specific gravity than the lighter, and is repeatedly substantiated throughout this study. In appearance, 451, or 54.0 per cent, of the urines were turbid, and 376, or 46.0 per cent, were clear; 686, or 83.0 per cent, of the urines were acid in reaction; 133, or 16.0 per cent, were neutral; and 8, or 1.0 per cent, were alkaline in reaction. Albumin occurred in 76, or in 9.0 per cent, of the urines; of these 6 urines, or 0.7 per cent, showed the presence of albumin only. Sugar occurred in 13, or in 1.6 per cent, of the urines; of these 1 showed the presence of sugar only. Indican was found in 128, or 15.5 per cent, of the urines; of these 31, or 3.7 per cent, showed the presence of indican only. Bile occurred in 16, or 2.0 per cent, of the urines; of these 1 showed the presence of bile only. Casts were found in 192, or 23 per cent, of the urines; of these 34, or 4.0 per cent, showed the presence of casts only. Cylindroids occurred in 44, or 5 per cent, of the urines, of which 5, or 0.6 per cent, showed the presence of cylindroids only. Pus occurred in 141, or 17 per cent, of the urines; of these 31, or 3.7 per cent, showed the presence of pus only. Mucus shreds occurred in only 3 urines, of which 2 showed the presence of this finding only. Spermatozoa were found in 39, or 4.7 per cent, of the urines; the presence of this finding is reported, but is not included among the number of cases with pathologic findings.

The data giving the findings in terms of percentages of urines studied afford an idea of the frequency with which the findings may occur in any one case. In order, however, to obtain information regarding the frequency of the occurrence of pathologic cases, the number of cases with findings is given. Thus, in 214, or 62.0 per cent of the 335 cases studied, there occurred pathologic findings. In 40 of these cases indican only was present.

Indican is not found ordinarily in the urines of normal individuals. Under certain dietary conditions, however, indican appears and persists in the urine of normal persons. It has now been established that indican in the urine means incomplete digestion, gastrointestinal stasis or tetany (Phenol and Indican Excretion in a Case of Tetany of Intestinal Origin, G. E. Simpson, J. A. M. A., 75:18, page 1204 [1920]) or constipation. Therefore, if chronically present in the urine, it is an indication of autointoxication, the

direct connection of which with deviations in mental behavior is too well known to necessitate further emphasis. However, for the sake of those who may insist upon the unimportance of indican in the urine, the number of cases with this finding only was deducted from the total number of cases with general laboratory findings.

Even then, there still remain 174 cases, or 50 per cent, with findings of more or less pathologic significance. This is a rather high percentage, and points to the importance which organic conditions, responsible for such findings, may play in the psychoneuroses. Urinary findings do not occur consistently even in the urines of cases definitely established as pathologic from a clinical point of view. There occur days on which the urine is entirely negative. Emerson (L. C.) states that "the urine between two acute exacerbations may be perfectly normal even though the kidney be quite scarred." In another article (Cylindruria, *J. A. M. A.*, 46:5, 89, January 6, 13, 1906) the same author states that "albumin is an almost constant feature, and yet in some severe or fatal cases there may be but traces and this only on a few days, alternating with periods with none, even to death." This is likewise true of all the other urinary findings, particularly in the early and milder cases of urogenital involvements. A large number of the cases studied in this paper are represented by only one urinary specimen which proved negative. It is believed that had all cases been represented by an average of 5 to 7 specimens, the percentage of cases with findings would have been still greater.

Covey (*New York Medical Journal*, November 16, 1921) studied 262 cases admitted to this hospital from the clinical point of view only. He found that 69 cases, or 26.0 per cent, either had organic factors or were associated with organic conditions, and states that, "This is a rather high percentage of organic findings in a disease of supposedly functional origin and illustrates the value of painstaking investigation."

The routine urinary findings, as indicated above, double the percentage of cases associated with possible organic conditions, and further emphasize the value of painstaking investigation of the organic involvements of patients with even mild psychoneurotic manifestations. The percentage is sufficiently great, indeed, to tempt one to consider it additional data favoring the point of view of the organic basis of psychoneurotic maladjustments.

However, sight must not be lost of the fact that all the cases studied in this paper are of patients of mature age, whose troubles are of long standing, and, as was pointed out by Benton (*Journal*

American Medical Association, July 30, 1921) were merely crystallized out by the late war and brought to our attention by the War Risk Insurance Act. They are, therefore, chronic, and render invalid any clear deduction as to cause and effect. Similar studies among children afflicted with emotional and behavioristic difficulties would throw considerable light on the subject, and it is hoped that some one connected with juvenile work will accomplish it.

It may be argued that, since the group as a whole includes cases with definite organic involvements, the percentage of urinary findings becomes exaggerated. Such, however, is not the case, as may be seen from a comparison of the general group of 19 cases diagnosed as organic with no psychoneurotic manifestations, which were studied and the data given below.

Number of cases, 19; number of urines examined, 39; specific gravity, lowest, 1002; average, 1017; highest, 1031. Color of urine straw, 23, or 60 per cent, with an average specific gravity of 1017; amber color, 16, or 40 per cent, with an average specific gravity of 1025; appearance clear, 23 urines, or 60.0 per cent; turbid, 16, or 40.0 per cent. Reaction, acid, 33, or 85.0 per cent; neutral, 6, or 15.0 per cent. Albumin occurred in 3 urines, or in 8.0 per cent; casts occurred in 10, or 25.0 per cent, of the urines of which 5, or 12.5 per cent, showed the presence of casts only. Cylindroids were not found in any of the urines. Pus was found in only 4, or 10.0 per cent, of the urines. Indican occurred in 2, or 5 per cent, of the urines, of which 1 showed indican only. The total of cases as such with urinary findings was 9, or 24.0 per cent; excluding one case of pure indicanuria, there remain 8, or 20.0 per cent, of cases with laboratory urinary findings. Comparing the percentages of the findings of the entire number of cases studied with those of the straight organic subgroup, the predominance of urinary laboratory pathology in the first becomes evident.

The average specific gravity of the group of organic cases, as seen from Table 1 is considerably lower than the average of the group as a whole, and, although both lie within the normal limits, the average of the organic group is in the direction of the lower pathologic extreme. The percentage of cases with albuminuria was only negligibly greater in the general group. No glycosuria cases were found in the organic subgroup, whereas 1.6 per cent of the cases of the general group had sugar in the urine. The percentage of cases with indican in the urines of the general group was three times as great as that of the organic subgroup. Bile occurred in 2 per cent of the cases of the general group. Casts occurred in an almost equal

TABLE 1

	No. of Cases	No. of Urines	Ave. Sp. Gr.	Color				Appearance		Reaction		Albumin	Sugar	Indican	Bile	Casts	Cylindroids	Pus	Spermatozoa	Cases with Findings	Pure Indicanuria Excluded
				Yellow	Ave. Sp. Gr.	Per Cent	Amber	Ave. Sp. Gr.	Per Cent	Clear	Turbid	Acid	Neutral								
General group	345	827	1022	1022	73%	1028	27%	54%	46%	83%	16%	9%	1.6%	15.5%	2%	23%	5%	17%	4.7%	62%	50%
Organic subgroup	19	39	1017	1017	60%	1025	40%	60%	40%	85%	15%	8%	0%	5%	0%	25%	0%	10%	0%	24%	20%

percentage of cases of either of the groups under discussion. Cylindroids and spermatozoa were found correspondingly in 5 per cent and 4.7 per cent of the cases of the general group and none in the subgroup. Pus occurred in the urines of 17 per cent of the cases of the general group, and only in 10 per cent of the cases of the subgroup.

Summarizing the above data, laboratory pathologic findings, including cases of pure indicanuria, occurred in the urines of 62 per cent of the cases of the general group, and only in 24 per cent of the cases of the organic subgroup. If pure indicanuria be not regarded as pathologic, the percentages become correspondingly reduced to 50 per cent and 20 per cent. The above data conclusively prove that the high percentage of the pathologic urinary laboratory findings obtained among the general group of the cases studied was not due to the inclusion of purely organic cases, but is coincidental, to say the least, with the cases whose primary pathologic manifestations appear to be on the surface of an emotional or behavioristic type. Whether this means that the psychoneurotic disturbances in the cases under consideration are occasioned by deeply concealed organic factors, apparently insignificant, yet subtle, or whether the urinary findings are caused by the chronic psychoneuroses, cannot at this point be stated with certainty, although Table 1 seems to support the organic basis hypothesis.

THE HYSTERIAS

Among the 335 cases reviewed, there were found 107 cases, or 32.0 per cent, of hysterias. It is customary in this institution to make the diagnosis as explicit as possible, placing emphasis on points which make it clear, as to whether the predominant psychoneurotic manifestation is the sole condition under consideration, or whether it is associated with organic conditions, or with other secondary neurotic or mental manifestations. Special attention is given to stutterers, and in making the diagnosis, this affliction is clearly indicated.

Advantage was taken of these details, and the cases of the group of hysterias were analytically subdivided in the following seven subgroups, and the percentages of the urinary findings studied. This was done in order to ascertain, if possible, whether or not the coexistence of organic conditions, or of secondary neurotic or mental manifestations would be paralleled by some difference in the routine laboratory findings. The subgroups were as follows:

1. Hysteria simple, 24 cases, or 22.0 per cent.
2. Hysteria with other neurotic or mental manifestations, 21 cases, or 20.0 per cent.
3. Hysteria with stuttering only, 6 cases, 6.0 per cent.
4. Hysteria with stuttering and other neurotic or mental manifestations, 4 cases, or 4.0 per cent.
5. Hysteria with stuttering and organic conditions, 9 cases, or 9.0 per cent.
6. Hysteria with other neurotic or mental manifestations and with organic conditions, 11 cases, or 10.0 per cent.
7. Hysteria with organic conditions, 32 cases, or 29.0 per cent.

The disadvantage of this subdivision lies in the small number of cases to which the subgroups become limited.

Nevertheless, general ideas with regard to certain points may be obtained. Thus, it was found that the average specific gravity of the urines of the simple hysterias and of the hysterias with stuttering with the highest, (1028); that of the urines of the hysterias with other psychoneurotic or mental manifestations and with organic factors was the lowest, (1021); the average specific gravity of the other subgroups being 1024 and 1025. The values all lie within the normal, yet it may be of interest to note that the coexistence of either organic conditions, or of minor neurotic or mental manifestations individually should tend to reduce the average specific gravity in one instance 4 points and in another 3 points, whereas the coexistence of the two reduced the average specific gravity 7 points.

The percentages of the other findings distributed themselves in an irregular manner and made any generalization difficult. The occurrence of pus was the most constant, varying from 10 per cent to 20 per cent. The percentage of cases with laboratory findings including indican, was the lowest in the group of hysterias with organic conditions, (59 per cent); the highest in the group of simple hysterias, (75 per cent); and varied between 61 per cent and 67 per cent in the other groups. Pus and casts were the chief findings in the urines of both, the simple hysterias and the hysterias with organic conditions; the findings were more frequent in the former than in the latter. This is again a point worthy of note, which once more emphasizes the importance of a deeper search of the organic side, even of the supposed simple hysterias.

The cases of the hysterias were also classified as follows:

1. Hysteria without organic conditions,
2. Hysteria with organic conditions.

Both included the stuttering cases. The latter were also studied as a separate group.

3. Hysteria with stuttering.

The results are summarized in Table 2 on page 216.

In this classification, as in the preceding one, the specific gravities are of interest. Thus, the average values for the hysterias without organic involvements, and for the hysterias with stuttering were the same, (1026); whereas the average value of the hysterias with organic conditions was considerably lower, (1015). The average specific gravities of the straw colored urines in each of the subgroups were correspondingly lower than the average of the amber colored urines, which again substantiates the previously mentioned prevailing belief. The percentages of the numbers of the straw colored urines in the hysterias without organic conditions, and in the hysterias with stuttering, are about the same, being correspondingly 75 per cent and 73 per cent; the average specific gravity in both subgroups being 1025. The percentage of the number of the straw colored urines in the hysterias with organic involvements was considerably greater, 84 per cent, and the average specific gravity was considerably lower, 1012.

These findings point to marked similarity between the hysterias free from organic conditions and hysterias with stuttering, and substantiate the prevailing belief that stuttering is merely one of the channels into which ordinary hysterical expression flows. This is in agreement with the belief of Blanton (Blanton, S., *The Medical Significance of the Disorder of Speech*, J. A. M. A. 77:5, pp. 373-7, July 30, 1922) who states that the disorders of speech are due to the lack of ability to adapt emotionally to social situations.

THE NEURASTHENIAS

There were 70 cases, or 21 per cent diagnosed as neurasthenias. No differentiation was made by the diagnosticians between the congenital and acquired neurasthenias, evidently presuming that the history would offer such information, if wanted. The cases were, therefore, regarded as belonging to a single neurotic group. For purposes of study, this group was divided, first into four subgroups:

1. Neurasthenia simple, 13 cases, or 18.6 per cent.
2. Neurasthenia with other neurotic or mental manifestations, 17 cases, or 24.3 per cent.
3. Neurasthenia with other mental and neurotic manifestations and with organic involvements, 8 cases, or 11.4 per cent.

TABLE 2

	CASES		NO. OF URINES	AVE. SP. GR.	COLOR				AP-PEARANCE		RE-ACTION		CYLINDROIDS	PUS	SPERMAT-OZOA		CASES WITH LAB'Y FINDINGS	
	Number	Per Cent			YELLOW		AMBER		Clear	Turbid	Acid	Neutral			In Urines	In Cases	With Pure Indicaunria	Without Pure Indicaunria
Hysteria free from organic involvements	55	51%	102	1026	Ave. Sp. Gr.	Per Cent	Ave. Sp. Gr.	Per Cent	50%	50%	95%	5%	10%	21%	1%	1 case	67%	55%
Hysteria with organic involvements	52	49%	104	1015	1017	84%	1030	16%	55%	45%	85%	15%	7%	13%	0%	0%	60%	48%
Hysteria with stuttering	19	18%	58	1026	1025	73%	1030	27%	50%	50%	90%	10%	12%	11%	0%	0%	63%	58%

Second, into two subgroups, as follows:

1. Neurasthenia without organic involvements, 30 cases, or 43 per cent.
2. Neurasthenia with organic involvements, 40 cases, or 57 per cent.

The results are shown in Table 3 on page 218.

The first subgrouping, similar to the case in the hysterias, possesses the disadvantage, inherent to statistical studies dependent upon insufficient number of cases, yet the indications brought out by some of the findings are of interest and merit being pointed out. Thus, the average specific gravities of the subgroups deviate from the course, followed by the values obtained for the subgroups of the hysterias. The highest specific gravities, 1026 and 1025, were found for the subgroups of neurasthenias with other neurotic and mental manifestations and for the simple neurasthenias correspondingly. The lowest average was found in the neurasthenias with organic involvements; the average of the neurasthenias with other neurotic and mental manifestations and with organic involvements being 1024, or only one point below the value of the simple neurasthenias. The frequency with which the straw colored urines occurred in all the subgroups was practically the same. The percentage of acid urines decreased with the increase in the complications in the diagnosis. It was highest in the simple hysterias (95 per cent), lowest in the hysterias with other neurotic and mental manifestations and with organic involvements (80 per cent), and 87 per cent and 85 per cent correspondingly in the neurasthenias with other neurotic and mental manifestation and in the neurasthenias with organic involvements. The percentages of urines with casts and cylindroids followed similar curves. On the other hand, the percentage of urines with albumin or pus increased with an increase in the complications of the diagnoses. Although the points brought out above, arouse more than mere interest, no attempt at generalizing is made at this point.

The significance of the occurrence of sugar in the urine of persons afflicted with psychogenic difficulties, like the well known transient nervous glycosuria, has not been generally understood and properly regarded, although occasionally an article springs up in the medical literature, calling the attention of the psychiatrist to the importance of this finding. Thus, Pike (H. V. Pike, *Significance of Diabetes Mellitus in Mental Diseases*, J. A. M. A., 76:23, 1571-1572, June 4, 1921) comes to the conclusion after a study of some cases with diabetes mellitus, that this organic condition may occur in the case of any psychosis as a purely physical complication, and may be the

TABLE 3

	CASES		No. OF URINES	COLOR				AP-PEARANCE		RE-ACTION		ALBUMIN	SUGAR	INDICAN	BILE	CASTS	CYLINDROIDS	PUS	SPERMAT-OZOA		LAB'Y FINDINGS IN CASES		
	Number	Per Cent		YELLOW		AMBER		Clear	Turbid	Acid	Neutral												
				Ave. Sp. Gr.	Per Cent	Ave. Sp. Gr.	Per Cent																
Neurasthenia simple	13	18.6%	38	1025	1024	73%	1025	27%	37%	63%	95%	5%	8.0%	2.1%	0%	30%	5.4%	11%	2.7%	7%	Including pure Inducanuria	Excluding Pure Inducanuria	
Neurasthenia with other neurotic or mental manifestations	17	24.3%	39	1026	1024	73%	1028	27%	46%	54%	87%	13%	5%	10%	2.6%	23%	5%	13%	15%	30%	70%	70%	
Neurasthenia with organic involvements	32	45.7%	73	1021	1019	72%	1026	28%	53%	47%	85%	15%	10%	4%	19%	1%	22%	4%	23%	4%	80%	70%	
Neurasthenia with other neurotic and mental manifestations and org. involvem.	8	11.4%	27	1024	1024	80%	1030	20%	56%	44%	80%	20%	26%	11%	0%	11%	3.7%	33%	7.4%	25%	75%	50%	
Neurasthenia general, free from organic involvements	30	43%	77	1025	1025	75%	1028	25%	41%	59%	91%	9%	4%	15%	1%	26%	5%	12%	9%	8%	70%	65%	
Neurasthenia general with organic involvements	40	57%	100	1021	1020	75%	1026	25%	54%	46%	83%	17%	14%	3%	17%	1%	19%	4%	26%	5%	4%	80%	65%

direct etiological factor in the development of the psychosis. He believes that if this condition is early recognized and promptly treated, the progress of the mental disorder may be stayed. Comparing the figures of Tables 2 and 3, it is seen that the percentage of urines with sugar among the hysterics and neurasthenics free from organic involvements was practically the same, whereas the percentage was considerably greater among the neurasthenics with organic involvements, than among the corresponding hysterics. The significance of this finding, however, does not lie in the percentage of urines, but in the type of neurotic individual in whom; and in the conditions under which it is found. The scope of this paper does not include the study of these factors, and the sugar findings will not, therefore, be discussed further in this paper, but will be taken up in connection with another investigation.

The second subdivision of the group of the neurasthenias brought out the following points. The average specific gravity of the neurasthenias with organic involvements was less than the one of the neurasthenias without organic involvements. This is in accord with the way in which the average specific gravities followed in all groups; however, the difference between the higher and lower values was considerably greater in the hysterics than in the group under consideration. The average specific gravity in hysterics with organic involvements was 1015 and that of the neurasthenias with organic involvements 1021. The percentage of the straw colored urines in the hysterics with organic involvements was 84 per cent, and in the neurasthenias with organic involvements 75 per cent. This clearly means that the lower average in the hysterics with organic factors was due not to the occurrence of a few pathologically low urines, but to a more general occurrence of lighter urines among the hysterics. Two possible explanations arise in this connection. First, that hysterics, generally speaking, ingest more fluid than do the neurasthenics, and second, that the elimination of the neurasthenics is lessened. These points seem worthy of investigation and a thorough understanding of them may prove of therapeutic value.

The percentage of acid urines, as in the hysterics, was greater in the uncomplicated neurosis than in the neurosis with organic involvements. The same was true of the urines with casts and with cylindroids. The percentages of urines with albumin and with pus were greater in the neurasthenias without the organic conditions, which is the reverse of what was found in the hysterics.

The above study of the results under consideration, brings out

with certain definiteness differences in the percentages of the routine urinary findings of the subgroups of the hysterics and of the neurasthenias. It shows also that the courses followed by the differences in the urinary findings of the subgroups of the two neuroses studied are distinct, pointing thereby toward a probable parallelism between the general descriptive differences, the primary basis of the diagnoses, and the differences in the coincident urinary findings of the two neuroses discussed.

THE ANXIETY NEUROSES

The external expressions of cases with mental and behavioristic deviations designated as the anxiety neurosis, or the neurosis of fears, differ from the manifestations of the two previously discussed neuroses. They are, therefore, classified by some psychiatrists as a separate group. The underlying psychic and emotional currents, however, are not sufficiently clearly defined and in some instances are of a distinct hysterical type; in others, they seem to be occasioned by exhaustion phenomena, and in many other cases border very closely upon the hypochondriases. The advisability of placing the anxiety cases in a separate and distinct group may, therefore, be questioned. However, they are discussed here as a group, since, as stated previously, the groups studied in this paper were in accordance with the diagnoses found in the histories.

There were found 37 cases, or 11.0 per cent, diagnosed as anxiety. For purposes of study, they were subdivided, as were the neurasthenias, first, into four subgroups:

1. Anxiety simple, 7 cases, or 19 per cent;
2. Anxiety with other mental or neurotic manifestations, 9 cases, or 24 per cent;
3. Anxiety with organic involvements, 13 cases, or 35 per cent;
4. Anxiety with other mental and neurotic manifestations and with organic involvements, 8 cases, or 22 per cent; and second, into two subgroups as follows:

1. Anxiety without organic involvements, 30 cases, or 43 per cent;
 2. Anxiety with organic involvements, 4 cases, or 57 per cent.
- The results are shown in Table 4 on page 221.

The specific gravity averages of the four subgroups followed the same course as did the averages of the neurasthenias. The percentages of urines with albumin, with a slight deviation, followed the same course. The percentages of the other findings were too irregular to make any general remarks possible.

In the second subgrouping, the average specific gravity of the

TABLE 4

	CASES		No. of URINES	COLOR						AP-PEARANCE		RE-ACTION		SUGAR	INDICAN	BILE	CASTS	CYLINDROIDS	Pus	SPERMAT-OZOA		CASES WITH LAB'Y FINDINGS	
				YELLOW		AMBER																	
	Number	Per Cent		Ave. Sp. Gr.	Per Cent	Ave. Sp. Gr.	Per Cent	Clear	Turbid	Acid	Neutral	Albumin	0%							10%	7.7%	0%	10%	7.7%	7.7%	11 urins	In Urines	In Cases	With Pure Indicanuria	Free from Pure Indicanuria
Anxiety, simple	7	19%	39	1027	1025	54%	1029	46%	54%	46%	95%	5%	7.7%	2.6%	10%	0%	10%	7.7%	7.7%	1 case	1	57%	43%
Anxiety with other neurotic and mental manifestations	9	24%	28	1026	1025	86%	1031	14%	36%	64%	75%	25%	3%	0%	14%	3%	40%	7%	18%	3 cases	3	25%	21%
Anxiety with organic conditions	13	35%	58	1019	1018	91%	1032	9%	50%	50%	84%	16%	17%	0%	27%	2%	40%	9%	2%	1 case	1	70%	61%
Anxiety with other neurotic or mental manifestations and with organic conditions	8	22%	38	1026	1025	87%	1034	13%	58%	42%	93%	7%	18%	0%	18%	0%	57%	8%	18%	2 cases	2	53%	50%
Anxiety general, without organic conditions	16	43%	67	1027	1025	60%	1030	40%	46%	54%	88%	12%	8.8%	1.5%	12%	1.5%	22%	7%	12%	4 cases	4	77%	66%
Anxiety general, with organic conditions	21	57%	96	1022	1020	90%	1033	10%	53%	47%	89%	11%	17.7%	0%	24%	0.5%	45%	8.3%	8.3%	3 cases	3	70%	60%

anxieties with organic involvements was lower than that of the anxieties without organic involvements, the values approximating those of the corresponding neurasthenia subgroups. On the other hand, the percentage of the lighter urines in the subgroup of the anxieties with organic involvements approximated that of the hysterias. The percentages of urines with albumin, with casts, and with cylindroids are markedly greater in the anxieties complicated by organic involvements, than in the anxieties without organic involvements; the percentages of urines with pus, however, ran the reverse course. It is thus seen from this table that the course followed by the percentages of the urinary findings in the subgroups of the anxieties closely approximated that of the neurasthenia subgroups, though the values were considerably greater.

COMPARATIVE STUDY OF THE URINARY FINDINGS OF FIVE GROUPS

The urinary findings of the hysterias, neurasthenias, and of the anxieties as integral groups, as well as the findings of the constitutional psychopathic group, and of the group of organic cases were classified and given in Table 5. In this table the columns with the data of Albumin, Sugar, Indican, Bile, Casts, Cylindroids, Pus, and Spermatozoa, are divided each into two sections, the first giving the percentages of urines, and the second, the percentages of cases with the corresponding findings.

The constitutional psychopathic states are not regarded usually as neuroses. Diefendorf, for instance, following the classification

TABLE 5

	CASES		NUMBER OF URINES	AVE. SP. GR.	COLOR				APPEARANCE		REACTION		ALBUMIN	
	Number	Per Cent			YELLOW		AMBER		Clear	Turbid	Acid	Neutral	In Urines	In Cases
					Ave. Sp. Gr.	Per Cent	Ave. Sp. Gr.	Per Cent						
Hysteria	107	32%	206	1025	1024	80%	1030	20%	60%	40%	80%	20%	10%	13%
Neurasthenia	70	21%	177	1023	1022	73%	1023	27%	52%	48%	86%	14%	9.6%	11%
Anxiety	31	11%	163	1024	1022	77%	1030	23%	50%	50%	80%	20%	12%	22%
Constitut. Psychopath.	28	8.3%	87	1022	1022	77%	1025	23%	50%	50%	80%	20%	4.3%	14%
Organic	51	16%	108	1023	1022	72%	1026	28%	53%	47%	84%	16%	7.4%	10%

of Kraepelin, considers them as a distinct and separate group. It may seem illogical, therefore, to compare them in any way with the hysterias, neurasthenias, and anxieties. However, the cases that come under the care of this institution are not of the profoundly morbid type to which the term insanity is applied, but are rather "the psychopathic personalities." They have distinct behavioristic afflictions, and abnormal emotivities, and in this respect simulate the other diseases studied in this paper. A comparative study of the urinary findings in the psychopaths with those of the groups of hysteria, of neurasthenia, and of anxiety, may, therefore, be of interest.

The group of the organic cases, as here given, included those diagnosed as simple organic, and as organic with secondary neurotic or mental manifestations. The findings of this group are offered as a basis for the comparison of the urinary findings of the other groups.

The following points are brought out by the table. The average specific gravities of the five groups studied were above the value considered average by Webster, (1920), (Diagnostic Methods, Sixth Edition), although they were all within the normal limits. The highest average, 1025, was obtained in the group of hysterias; the lowest, 1022, in the psychopathic group; the same average was obtained for the organic and neurasthenic groups (1023); the average in the case of the anxieties was 1024. The difference in the above values is too small to make any general remark in connection with

TABLE 5—Continued

SUGAR		INDICAN		BILE		CASTS		CYLINDR.		PUS		SPERMAT.		CASES WITH LAB'Y FINDINGS	
In Urines	In Cases	In Urines	In Cases	In Urines	In Cases	In Urines	In Cases	In Urines	In Cases	In Urines	In Cases	In Urines	In Cases	With Pure Indicanuria	Excluding Pure Indicanuria
2%	4%	14%	22%	1%	2%	21%	22%	8%	10%	11%	23%	0.5%	1%	54%	45%
3.4%	4%	11%	30%	1%	3%	22%	36%	4.5%	11%	20%	36%	7%	15.7	77%	66%
0.6%	0%	19%	46%	1.2%	5.4%	36%	35%	8%	22%	9.8%	21.6%	11.6%	22%	80%	70%
1%	1 case	9.2%	25%	1%	3% 1 case	16%	32%	0%	0%	28%	43%	2.3%	7%	50%	46%
1%	0%	12%	18%	0%	0%	21%	27%	2%	4%	11%	15%	3.7%	6%	50%	44%

them of any import. The relation of the percentages of urines with acid and neutral reaction, likewise were the same in all the groups.

The occurrence of albuminuria was rather high in all groups. The percentages of cases were about the same in the organic, hysteric, neurasthenic, and psychopathic groups, though the persistence in each case, as may be judged from the percentage column of albumin per cent in urines, varied some. In the anxieties, both, the percentage of cases with albuminuria, and the persistence with which the finding occurred in each case were greater than in the rest of the groups. Albuminuria cases in this group were twice as frequent as among the neurasthenics. This points to the probability of kidney involvements being a rather common occurrence among persons afflicted with anxiety neurosis. The number of cases and of urines with sugar was too small to make any discussion in connection with this finding worth while.

The percentage of cases with indican in the urines of the groups discussed, followed a curve that is worth being studied more thoroughly. Thus, following the ascending order, the lowest percentage occurred among the organic group (18 per cent); this was followed by the hysterical group (22 per cent); then by the constitutional psychopathic personalities (25 per cent); by the neurasthenics (30 per cent); and finally by the anxiety cases (46 per cent), among whom the occurrence of indican was the most frequent.

That the course followed by these percentages is not accidental, but is the logical sequence of definite conditions, becomes clear, if it is remembered that the efficiency of the gastrointestinal processes is dependent to a large extent upon emotional states. Cannon (Cannon, *The Movements of the Stomach Studied by Means of the Röntgen Rays*, *Am. Jour. Phys.*, 1898, Vol. I, p. 359) found that worry, fear, and anger cause inhibition of the gastric peristalsis in the dog. He also showed that the same was true of the small and large intestines (Cannon, *The Movements of the Intestines Studied by Means of the Röntgen Rays*, *Am. Jour. Phys.*, 1902, Vol. VI). Later other investigators showed this to be true of other animals as well as of man. It can be safely assumed that the more frequent the unfavorable emotional states are, the more frequent will be the occurrence of indigestion, intestinal stasis, or even of tetany, and hence of abnormal food decomposition. The latter invariably results in an accumulation of indol which is absorbed into the blood stream, and is eliminated with the urine as indoxyl potassium sulphate or indican.

The organic group (Table 5) being free from cases with primary neurotic disturbances consists of individuals more balanced emo-

tionally, and accordingly it shows the lowest percentage of cases with indicanuria. The constitutional psychopathic personalities, the victims of uncontrollable impulses, become upset emotionally more easily and more profoundly than do the hysterics. They are less careful about the quantity and quality of food ingested, and, hence, the percentage of cases with indicanuria in this group is higher than among the hysterics. The ease with which neurasthenics are disturbed emotionally when confronted with the daily demands of life for endurance, patience, and perseverance, and the frequent association with neurasthenia of gastrointestinal conditions, such as visceraptosis, etc., furnish the cause for the percentage of cases with indicanuria being greater in this group than either in the hysterics or in the psychopathic group.

The gastrointestinal status in anxiety neurosis hitherto has attracted little attention. More was heard in this connection about the neurasthenic than about any other psychoneurotic. Yet a review of the literature dealing with the effect of emotions upon gastrointestinal secretion and motility (Cannon, 1898, 1902 L. C., and "Bodily Changes in Pain, Hunger, Fear, and Rage," New York and London, 1918) brings out worry and fear as the most outstanding. These two emotions, let it be remembered, are the main symptoms around which the anxiety neurosis complex is built. It is, therefore, reasonable to suspect that the gastrointestinal inhibitions followed by abnormal food decomposition, should be higher in the anxiety neurosis than in any other neurosis. Table 5 proves this suspicion to be true by disclosing the most frequent occurrence of cases and of urines with indican in the anxiety group, as is shown by the percentage column of indican.

No cases with bile acids were found among the organic group, whereas in the other groups the percentages of this finding followed the same course as did the two previously discussed findings, the percentages being highest among the anxiety group. The percentages of cases and of urines with casts were rather high in all the groups discussed and deserve being studied more closely. Using the percentages of the organic group (cases 27 per cent, urines 21 per cent) as the basis for the comparison, it is evident that cases and urines with this finding are as frequent among hysterics as they are among persons afflicted with organic conditions. The percentage of cases with this finding is markedly higher among the psychopaths, but the persistence with which it occurs in any one case in this group is considerably lower than either in the organic or in the hysteric groups. The percentages of cases with casts are highest, and are

about the same among the anxiety and neurasthenia groups, 36 per cent and 35 per cent correspondingly. The persistence in any one case being the highest, 36 per cent, among the anxieties. No cylindruria was found among the psychopaths, only a negligible percentage was found among the organic cases, a noteworthy percentage among the hysterics and neurasthenics, the values being 10 per cent and 11 per cent for the cases, and 8 per cent and 4.5 per cent for the urines; the percentage of cases with this finding among the anxieties, like that of some of the other findings, was the highest, 22 per cent.

Cylindruria, like the occasional pus cell, has been mistakenly disregarded by the general practitioner and by the psychiatrist, especially in cases where no organic disturbance is easily found. It may be of interest, in this connection, to summarize a few of Emerson's findings regarding cylindruria (L. C.). He states that pure cylindruria occurs in cases of evidently slight irritation of the kidneys, due to foods and drugs; in certain diseases, especially valvular heart disease, arteriosclerosis, certain diseases of the nervous system, inflammatory diseases, and acute infections. The data given in the above paragraph should warn the medical men dealing with the so-called psychoneurotic patients, against such a light attitude toward cylindruria occurring among his patients.

The percentages of cases and of urines with pus were considerably higher in the groups including the neuropsychiatric cases, than in the organic group; this substantiates the conclusion brought out early in this paper that the predominance of urinary pathology among psychiatric cases is not due to any organic cause lying on the surface; but to some organic involvement which is concealed from the eye of the average diagnostician, yet subtly associated with the neurotic or mental abnormalities.

It is worthy of note that only one case and one urine showing the presence of spermatozoa should be found among the large number of cases of the hysterics reviewed. The conspicuous absence of this finding in this group is not a mere accident, and undoubtedly has its explanation. The percentages of cases and of urines with this finding among the neurasthenics were 15.7 per cent and 7 per cent correspondingly. These are rather high percentages as compared with those of the organic and psychopathic groups, and their magnitude may be due to the sexual weakness which is believed to obtain among the neurasthenics, causing involuntary nocturnal and morning seminal emissions.

The percentages of cases and of urines with spermatozoa in the

anxiety group were very high, indeed, the highest of all the groups studied, 22 per cent and 11 per cent, correspondingly, and point toward a probability of the seminal emission being more frequent among the anxiety cases than among the neurasthenics. An intimate acquaintance which the writer has of the sexual side of some of the cases belonging to this group, strengthens his belief that many of the anxiety patients, though potent and seemingly not shunning the opposite sex, are sexually backward. They are the "persons who out of fear for the consequences of sexual relations satisfy themselves with handling or looking at the woman" (Freud, S., *Selected Papers on Hysteria and Other Psychoneuroses*, New York and Washington, 1920, p. 142) or compensate by resorting to masturbation. It is to be expected that such frustrated excitement and abnormal gratification of the sex impulse should cause frequent seminal emissions and urethral congestion. This is substantiated by the figures in Table 5, which show the highest percentage of cases with cylindruria and with spermatozoa to be among the anxiety group. The frequent occurrence of the spermatozoa in the morning specimens can be explained by assuming that the frustrated sexual excitement usually takes place previous to falling asleep or on waking in the morning.

To sum up the points brought out by the data given in Table 5:

The percentages of cases and of urines with any of the discussed laboratory urinary findings in each of the groups of the neuroses, and in the psychopathic group were greater than in the organic group. With slight deviations, the percentages were about the same in the groups of hysterics and psychopaths. The percentages were high among the neurasthenics, but the highest in almost all instances in the anxiety group. This tends to indicate that the organic side of cases of the mental groups under consideration is of profounder significance than has been heretofore presumed. It strengthens the prevailing belief that the organic involvements in the neurasthenias are more serious than those of the hysterics. It brings forth the probability, heretofore not spoken of anywhere, that the organic involvements of the anxieties, though not so easily discernible and oftentimes completely shaded from view, are of a deeper pathology than are those of the neurasthenics.

Finally it discloses noteworthy percentages of urines and of cases with spermatozoa among the neurasthenics and high, indeed the highest, percentages among persons manifesting the anxiety symptom complex. This point has not been brought out anywhere in the literature, so far as the writer knows, and it is of practical as well as

of theoretical value. Its theoretical significance will be discussed elsewhere; at this time it will be merely pointed out that the high percentages of spermatozoa findings among anxiety-neurotics may be regarded as evidence supporting Freud's theory concerning the "occurrence and etiology of anxiety neurosis" (L. C., p. 141).

No other groups of cases were discussed because of the insufficient number of cases found.

CONCLUSIVE STATEMENT

A survey of the routine urinary findings of 335 of the cases admitted to the U. S. Veterans' Hospital No. 37 during the calendar year of 1921 was made. Many points of general interest are brought out. In a final summary, the statement of them, being free from qualifications, would appear too categorical or even dogmatic. This the writer wishes to avoid, and the reader is referred to the preceding pages. Some of the more general points, however, are given.

It was brought out that a parallelism exists between the differences in the occurrence of the urinary pathology and the descriptive psychic and behavioristic differences upon which the classification of the cases is based.

It was also brought out that the coincidence of other neurotic or mental manifestations, or of organic involvements, or of both, with the primary neurosis, occasions certain deviations in the urinary findings.

The pathologic urinary findings were less in the organic group than in any of the other groups studied; they were about the same in the groups of the psychopaths and of the hysterics; considerably higher in the group of neurasthenics, and the highest in the anxiety group.

Acknowledgment is made to Surgeon Lawrence Kolb, to Miss F. L. Shuman, and to Dr. E. L. Miloslavitch, Director of the Department of Pathology and Bacteriology, Marquette University Medical School.

A CASE OF FACIAL HEMIATROPHY WITH CONVULSIONS

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The patient, J. G. R., aged twenty-four, male, single, sheet metal worker, gave an uncertain history of infectious diseases in childhood, probably diphtheria and scarlet fever. He did fairly well in school, failing to pass only once. He left school at fourteen and engaged in clerical work and had only one employer in the time intervening before military service, August, 1917, at the age of twenty-one.

He ascribes his present condition to typhoid prophylaxis administered that month but the history shows no unusual results. All injections were given in the subscapular region, produced the usual amount of local inflammation and pain and only the second sent him to bed because of malaise. He was not delirious and was up again in twenty-four hours. Venereal infection was denied.

The onset of the present condition was put at about two months after the completion of the prophylaxis when he observed that his left eye was receding. About a month later he found the muscles of the left side of his face were wasting and a furrow appearing in the midline of the forehead and chin. The only pain was that accompanying some twitching in another muscle group—the right subscapular. Facial hemiatrophy increased rapidly and in February, 1918—five months after the onset—he began to notice the same process in the left side of the tongue. There has never been any evidence of disturbance of salivary or lachrymal secretions, of taste or of fragility of the teeth. At about the time of onset he began to have spells which are described by a brother. They begin with a cry, he becomes unconscious, both sides of the body convulse, the left more violently than the right, in the brother's opinion. The eyes are rolled up and the tongue bitten and there is frothing. There is a period of mental clouding for about one-half hour after the attack. The duration is about five minutes; they are usually nocturnal. The frequency has increased to about two a week.

Neurological Examination: There is no subjective disturbance of smell. The ophthalmologist's report is "Astigmatism. Fundus normal. Vision practically normal. No strabismus or nystagmus." The pupils are equal but react a little sluggishly to light. Dilatation of the pupil on painful stimulation of the side of the neck cannot be elicited on either side. Power of the masseters and pterygoids is normal on both sides but palpation shows definite loss of substance of the left buccinator. The jaw jerk is lively. Sensation is normal in the distribution of the left fifth cranial nerve and the corneal

reflex unimpaired. On mimic display no difference in the movements of the facial muscles can be seen. Electrical tests show: Faradic stimulation of the sound side over the aborization of the seventh cranial nerve produces minimal contraction of the facial muscles at about the usual strength of current. Stimulation of corresponding part of the atrophic side produces an excessive contraction of an unusually great rapidity. Galvanic stimulation shows a similar difference between the two sides. Galvanic and faradic stimulation of the masseters of the sound side give no unusual results. Similar stimulation of the atrophic side gives no response



Fig. 1

except in the limited muscle bundle near the angle of the jaw. Hearing is grossly normal, the pharyngeal reflex active and the tongue protrudes in the median line. There is no weakness of either sterno-mastoid. Gait and station are normal. There are no abnormalities of power, tone, nutrition, coördination or sensation. There is no tremor or fibrillation. Reflexes are normal. There is normal hirsuties in the whole body except that the left eyebrow has entirely disappeared and according to the patient's story no growth of beard on that side of the face.

Blood Wassermann is negative. Radiograph shows thinning and atrophy with absorption of the alveoli of the left side of the mandible.

The accompanying photographs are furnished by the patient and published with his consent. Number 1 was taken during his first leave from camp about one month after induction, that is before the first symptoms were observed by him. Number 5 in November, 1920.

This condition is of great rarity. Dana in the last edition of his textbook (1920) states that about one hundred cases have been reported. The case reported here is characteristic. The development is insidious. There is gradual wasting of the skin on one side, loss of hair, and absorption of bone. Loss of teeth has not yet occurred.



Fig. 5

Various neurological conditions are known to accompany the syndrome—tabes dorsalis, syringomyelia and epilepsy. In the patient I report we are dependent on the testimony of a brother for the diagnosis of epilepsy, but it gives the impression of reliability. The age at onset is a little above the usual. Cases so far reported have begun between the tenth and twentieth year. The absence of sensory changes or spontaneous pain is usual. The electrical reactions of the affected side are ordinarily unchanged but here there was a most definite hyperexcitability.

The appended bibliography is from the Index of the Library of the Surgeon General (1920). The quarterly Cumulative Index shows no cases for 1921. But little of the literature has been at my

disposal. The case of Abrams (4) is of particular interest. The atrophy was accompanied by supraorbital neuralgia with complete anesthesia and analgesia of the skin supplied by the second trigeminal branch. Olfactory sense was diminished on the affected side.

Huber's case (15) was observed soon after birth and is ascribed to trauma by obstetric forceps.

A reference not contained in the list of the Surgeon General's Library concerns the only pathological report I have found (31) and is a note signed by Skarpman recording pathological findings of Virchow and Mendel. This patient died of pulmonary tuberculosis. There was atrophy of the left arm (muscle groups not indicated) as well as left facial hemiatrophy. The neurilemma of the fifth nerve on that side was "four times as thick," and the nerve trunk crossed by sclerotic bands. The nerves were degenerated. The pathological designation was neuritis interstitialis proliferans. The substantia ferruginea of the affected side was atrophic. (The substantia ferruginea consists of a motor nucleus of the fifth nerve smaller and more cephalad than the chief motor nucleus.) In the cord there were "changes at the fourth cervical level with partial atrophy of the ganglion cells of the anterior horn." This same note of Skarpman reports two cases of facial hemiatrophy in conjunction with multiple sclerosis with negative findings postmortem in the central connections of the trigeminus.

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TRANSLATIONS

EMOTION, MORALITY, AND BRAIN*

BY PROF. C. V. MONAKOW

ZÜRICH

(Continued from page 155)

Of course, there are transitions, that is, border areas between these four forms of instincts. It is especially to be noted that the social feelings possibly develop in the minute differentiation of the primitive reciprocal relationship between the "mother animal" and the "daughter animal." In my opinion the basis for the first modes of expression in gestures and for symbolism when these, in final development, reach articulate speech, is found in the primitive relationship between mother-cell and daughter-cell, on mother animal and daughter animal, at a certain stage of evolution. The social feelings and media of understanding represent a perfected continuation and extension of relationship between individuals of similar species that lead a collective life (social, that is, animals living in groups, herds, etc.).

In the ancestral mother, that is, the oldest and most capable individual, the guidance and direction are sought, and these offices are later transmitted to the oldest and most capable individual of the collective group.

The further evolution of the sensual perceptions and instincts follow always with a view to the possibility of an improvement and betterment of the conditions of life (greater strength for overcoming obstacles, adaptation to difficult environments, self-training and practice, etc.); these go hand in hand with the efficiency of the nervous system to adapt itself morphologically to new circumstances.

In my opinion, every healthy creature is born with a germinative impulse, an impelling force towards a definite degree of perfection (ennoblement) which finds its expression anatomically through the tendency of the function to attain localization in the head "Wanderung der Function nach der Kopfende."

* Authorized translation by Gertrude Barnes, A.B., and Smith Ely Jelliffe, M.D., of the authors *Gefühl, Gesittung und Gehirn*.

What biophysical performances, that is, capabilities, may and must we attribute to those nervous systems which are still at the most primitive levels of development (numerous nerve cells plus molecular substances, "Fibrillenbänder," fibrillar strands and nerve fibers) nay even to simple living protoplasm (unicellular animals)?

1. In physiological-chemical sense: osmosis, periodical intake and elimination of chemical material through the physical cell-membrane. Life, as we all understand it, consists of a continuous autogenous (self-regulating) process of construction and destruction which is continually performed by the molecular cell activity until final dissolution takes place—death, self-preservation and self-destruction. The highly organized molecule (proteins) are supposed to have a position near the cell center (in proximity to the nucleus), and the organic and inorganic disintegration product (ausscheidungs Produkt) near the periphery.* In every molecule of the cell the complicated connections are near the center also (Aimé Pictet). It is not unlikely that even in the processes of assimilation and elimination of chemical substances there is realized a certain trace of pleasurable or painful sensation.

2. Sensitiveness to poisons (from within or without), accompanied with the ability to ward off injurious toxic attacks (up to a certain point of resistance, by changes of osmotic pressure, production of ferments, etc.) and to eliminate invading forces.

3. Irritability: The nerve cell does not contain only those elements with which to sustain its own life, in chemical or morphological balance, but it actually alters itself in keeping with forces within itself. It changes its tension under the influence of stimulus from the outer world: contact and distance stimuli; light, sound, electrical, temperature, stimulation, etc. The cell can under such stimulation (in measure proportionate to its inherent force, be charged, and react in movements (change of locality, muscular contractibility) and this, indeed, in very different ways. Every animal possesses besides the capacity of orientation in space and time, on its own body and also the power of locomotion.

4. Every cell manifests mnemical peculiarities. Stored up latent irritabilities periodically produced, up to any point of endurance by more immediate actual stimulation (through the ecphoric medium, R. Semon). Early in primitive life the following differentiating gradations in the irritability of the nervous system can be discerned:

* "Open and closed chain," through retrograde metabolism autointoxication of the cell a possible theory (Aimé Pictet).

(a) The "extroceptive" stimulation (external stimulation, Sherrington).

(b) Interoceptive stimulation (stimulation from within).

(c) The stimuli flowing immediately out of the nervous action of the organism itself, registering the self-activity of the nerve substance, that is to say, the proprioceptive stimuli constituting the foundation for "engraphia" and "ecphoria."

(d) Where there are several forms of stimuli serving manifold purposes, there arises association and collision of the stimuli with proportionate effects, which may be considered as resultants.

5. In a biological relation. For every cell there is an inner germ of emotion, which in the minimum finds expression as primitive will. Here is also to be found the source of self-protection and defense against harmful stimuli. I would ascribe to every cell a minimal primitive quality of reflection of self, equivalent to the feelings of pleasure and pain.

6. Capacity of growth or of reproducing creatures of the same sort, of development according to a given mnemonic type.

7. To these should be added the capacity possessed by all living beings of adapting themselves within varying limits to new conditions of life and of perfecting themselves in manifold ways resulting in the growth of new and better qualities.

8. Biological perfection takes place through increase of the tissue, construction of new organs, and division of labor. The differentiation of the nervous system in the direction of division of labor must be particularly emphasized. This latter process results in the localization of the functions in the central nervous system, in the higher animals.

9. Perfection of functions in the ascending levels of the animal world proceeds in manifold directions. At a certain level it leads to gregarious life, that is to say, to life in groups, swarms, etc., the individuals of which are dependent on each other both at the period of their actual existence and educationally for the development of new and higher emotional values (the first germs of morality).

10. Where a nervous system is present the nervous elements may be functionally injured in various ways. They may be disturbed in their functioning through too great stimulation or through the interruption of continuity with resulting injuries of the following forms: (a) the so-called psychic shock (thymoplexy), (b) shock from strong insult at the surface of the body and of the inner organs

(cellulopetal), (c) through diaschisis, shock through interruption of the contact of the elements en masse; and finally through general central shock in the form of coma or collapse, this latter being characterized by the circumstance that it may be produced by influences spatially distant.

11. Through cutting off of the circulation, through disuse of the organs or nerve combinations, and through compressions, degeneration, reversions to rudimentary states, atrophies, and finally, death may be produced.

The further development in respect to the more extended historical evolutionary structure of emotion becomes determined through the direct and indirect vital life interests on the basis of the laws of memory and of the morphological-anatomical potentialities (structure of the central nervous system), especially on the foundation of the structure of the sense organs and of their centers (communication with the outer world: exteroceptive nervous system).

The activities of the sense organs and the musculature leads to sensation ("reception") and this produces emotion, that is, the "censor," for the resultant of the combined sensation and perception. On the other hand, a definite archetype of emotion, *i.e.*, instinct, adapts the sense organs to the stimulation of the musculature, and sets them functioning (for instance, attitude of the eyes and head towards the source of stimulus), a performance (sight) which represents an estimation of the value of the thing perceived for the economy of life. Between "sensation" and "emotion," consequently, the close inter-relations already existing are further maintained.

The oldest and best known elemental emotion, which indeed makes itself felt in the lowest animals in the form of keen desires, are the needs for air, light and food. This latter may be placed in parallel with pain. Both lapse into comfort or pleasure as soon as they are gratified. Pleasure and pain are bound up securely and directly with the vital, bodily processes and reflect in the soul the condition at any given moment of the struggle for equilibrium, not only of the separate parts of the body but of the organism as a whole. On these primitive emotions, instincts, with which the sexual emotion (driving force towards preservation of the race) is associated on further maturity of the individual, and the whole scale of other emotions, even morality itself, is definitely built up. The differentiation and increase of emotional values ensues under conditions of constant, at times fluctuating, often periodic assistance of the bodily secretions under consideration (secretions of the glands,

of the chromaffine cells; "inner" secretions), in the successive needs that increasingly arise during life, in the form of phases passing from one to another (chronogenic construction on the basis of experience).

As is well known, life is a continual series of occurrences, the perception of which is constantly influenced by previous experience. Furthermore, thousands of incidents are repeatedly exhibited with photographic accuracy, and, too, with the same "censor of the emotions." The "exposed film" that is being wound from the beginning of the individual life, builds from separate experiences, in spite of innumerable, uniform rotary motions—within due range—a continuity, to be sure, not wholly uninterrupted, and often changing with reference to the affectivity, and for that reason assuming different values in conformity with the nature of the subjective, very diverse estimation. From this, in the course of time, the personality or character of the individual becomes crystallized.

The new-born experiences emotion only in regard to what is immediately present and for little else (the direct expression of the needs of the body, the so-called "original emotions"). Simultaneously with each "original feeling" are felt in the adult the emotions which have been hard-won through experience, and through this experience, differentiated into the most delicate nuances. These are the emotions which set in activity further evolution and probably also the release of the emotions rising to the surface in the immediate present (illumination of the future). In this way, too, objective causality is set in action, and also its parallel subjective causality (reasons). The causal connection of things thus established under the control of the emotional values (of significance for the economy of life for the individual and for the community) in the form of the relations, in the sense of causes and effect.

A certain elementary subjective reflection of objective causality in the events of life may perhaps fall to the lot of creatures very low in the developmental scale and influence their acts; without, however, in my opinion, entailing either accumulation of new experiences or perfection of function.

The developments which the progressively increasing store of sensations (not the "emotions") in the sense of more accurate realization of the direct product of combined excitation of the sense organs (orientation in space and time) implies as we ascend in the animal kingdom are:

(a) The multiplication of the sense organs, refinement in their

structure, their intimate correlation, and, moreover, the enlargement in new modes of movement with adapted arrangement and structure of the extremities and other bodily parts, standing in the close association with them.

(b) Development in temporal relations and content of the various phases of life, extension of the life-curve—its duration. The more complicated the conditions essential to life, the greater and more varied the problems, which the creature has to meet, so much the more significant and more delicately organized must the sensations become (above all the “proprioceptivity”), and so much richer must be the form of orientation (gnosis) and of the intellect.

The world of emotion (affect, instinct, virtue, vice, character, etc.) in its phylogenetic and ontogenetic evolution or differentiation keeps pace with the world of sensation; that is, sensations and emotions continue to exercise a reciprocal influence on each other, their organization constantly becoming more delicate. Hand in hand with this refinement of the emotional life—on the higher phylogenetic planes of development—the separate emotional states as they occur undergo not unimportant changes. The feeling of pleasure or pain at a given moment (the original feeling in *statu nascendi*) is accompanied by memories of similar experiences (ceaselessly being accumulated), which increases the emphasis on the retrospective tension (anticipation) on the one hand, and the looking forward to prospective solution (gratification) on the other. In other words, innate pleasure and pain become emphasized step by step with enrichment of experience (that is, at the higher phylogenetic levels). The same is the case with all possible forms of tension and discharge, inclusive of the prospective tension looking toward the *Future* (anticipation). In this way the most distant future comes to be illumined by these emotions (hope, disappointment). Further, the oldest emotions of all, desire and wishing, receive through experience preserved in the form of ideas an essentially richer significance and purpose and a more constant form, rendered precise through causality, even though they do not undergo any great modification in regard to intensity.

The capacity to infer clues to the future in the immediate present, that is, the restoration of connection between cause and effect, the so-called “causality”—without regard whether this is accompanied with a vigorous subjective reflection or not (consciousness)—invests the genetical moments in the construction of emotion with peculiar significance. The result is the building up of “feeling thoughts”: the sorting out of certain experiences and of thoughts connected with them, according to their emotional values and their importance

in the economy of life for the personality, in the present and future, in this last respect also according to their value to morality. A host of emotional values are unthinkable aside from their more precise ideational content; for instance, hope, guilt, etc. Pleasurable feelings of this sort "discount" future values by reference to past values, and imprint thus a suitable seal on the present.

Through the structures of historical and evolutionary significance just now pointed out, or perhaps better called "temporal" structures, as well as through the ideational content increased through experience, the emotions can be refined and brought to greater perfection. They can, however, regress again, and decline in their moral value (deteriorate, degenerate). The more complicated they are in structure the more manifold are their forms of destruction.

A mile-stone in the differentiation and evolution of the emotions towards more delicate shades of emotional values is introduced when gestures were first given as means of communication (expression), *i.e.*, symbols from which, on a higher plane of development, verbal speech evolved. This level precedes the appearance of the so-called social emotions, which demand understanding between the separate individuals of the same species. Through the symbol and above all through articulate speech, the emotional values are stamped more permanently, and these values are connected in joint enterprises, and signify closer relations between separate individuals. Such emotional values of course represent complicated derivations from the basic emotions and instincts. But more of this later.

We may then agree that sensation and emotion are products of the evolution of the living substance; they are twin brothers, who have sprung from the stimulation and irritation of that substance, that is, the nervous elements, and they are indispensable to the vital economy. Sensation is the sequel and result of the stimulation of our senses and organs, whether the stimulation as it occurs, comes to "consciousness" or whether it remains in the fore-conscious or wholly unconscious, and only by chance manifests itself through action. To the world of sensation belong spatial and temporal orientation, then ideas directed to objects of the external world, with their wider derivations, in the form of knowledge and science (abstract thought, mathematics above all). Proprioceptively regulated stimuli (results of a reciprocal action between the already completed components of movements and the components which are on the verge of being manifested), that is, coördination, and reflex sensibility belong likewise to the world of sensation (unconscious reception or sensation).

The foundation of the emotions is a more or less sharply emphasized collision of forces which have been set into activity (primitive emotions, instincts). They represent the immediate momentary interests of the individual and provide the quality tone, the censor, for all processes that are becoming manifest in the nervous system, inclusive of those which are concurrently supplied from the emotional sphere. They form the immediate cause (driving force) for our actions. Morality then is founded on the primitive emotions, by making the greatest possible use of the sensations and of experience. The emotions (the primitive instincts of the living protoplasm) are therefore the primary factors; they really create and perfect the nerve substances, construct the brain, and the brain inclusive of the emotional sphere which, by reactive influence, is constantly creating new emotions, becomes the instrument for all our emotions, sensations, and thought. From the very beginning sensations and emotions have differentiated spheres, different anatomical substrata, which, however, in the course of life are overrun by the common secondary morphological products. For the sensations, the sensory cells, or sense organs, and the muscle nerves sensible to both extro- and introceptive stimuli, form the principal starting points. For the emotions, on the other hand, the visceral and sympathetic nervous system, together with the chromaffin cells and blood glands or inner organs serving these systems, constitute the starting point.

The combined result of the activities of the animal and of the sympathetic nervous system, as well as the qualification of the exteroceptive stimuli, as they are represented in the cortex, must be attributed in large part to the world of feeling. A sharper distinction between emotion and sensation on the higher level of cerebral activity, can not be undertaken.

The peculiar work undertaken and carried out by the mnemonic factor as well as the activities of the central representatives of the visceral falls in the sphere that we designate in daily life as instinct and appetite. The forcible release of these in the immediate present we call affect (active emotion). Through the common stimulation of the world of sensation and of the world of affect (experience), as well as through suitable selection and organization of the relative values, the basis is laid for the character and morality of men.¹

[¹ Morality is defined by various authors according to differing conceptions (empirical, rational, supernatural); fundamentally, however, all understand by morality very nearly the same thing. Plato

¹Footnote in original. []

conceives morality as the aspiration to become "god-like." Aristotle conceives it as the striving after Eudamonia. Spinoza: "the ultimate goal" (morality) is intellectual love of God ("amor dei intellectuallis"). Here he forms an idea of love as introspective knowledge, as philosophy. Leibnitz defines morality simply as the impulse towards perfection, and Kant in his precise way says: "Act in such a way that the maxim of your conduct can become at the same time the principle of a universal law (categorical imperative)". Schopenhauer defines morality as "denial of the will to live," consequently as something negative (one finds the key to this definition in Schopenhauer's conception of the world as will). Smith perceives in morality, judicious self-love, and Kirschner identifies morality with practical philosophy (similar to Spinoza). Finally, the Christian conception of morality is purity of heart and consecration of the will (see Kirschner).

From the historical biological standpoint, I might enter here into the following considerations. Morality develops phylogenetically from instinctive cultivation of the life interests that we hold most worthy and sacred, and has, as its final aim, the perfection of humanity with regard to the individual, family, tribe, fatherland, world. Through the cultivation of these last interests, the single interests of the individual become ennobled. In other words: morality is voluntary subordination of the individual life interests to the welfare of the group in the sense that a judicious correspondence is established between individual and group interests (the "rational self-love" of Smith). Morality has in mind essential future values, and is conceivable only on the basis of concern for the future (discrimination of values and broader conclusions arising out of it). The love instinct serves as their origin, and the love of men for one another can be built up only on the surrender of the strictly individual interests (suppression of instincts estimated as inferior). Morality is an egotism consecrated to the world interests of the future (altruism).

The struggle to attain pleasurable sensations and individual advantage forms an elementary and primary factor in every living creature. Pleasurable sensation controls, too, in men a whole scale of separate values, stable and ephemeral, altering from moment to moment, values which strive for preëminence: from the immediate, innate emotions worthy of expression, all the way to the effort

towards union with the unknown ("omnipotence of God or the universe"). The personal sacrifices which are produced under these circumstances present themselves principally as renunciation, self-restraint, industry, etc. The individual skill, hard earned through education and discipline, is to render an account to all qualified interests, and so to bring into harmony the world of feeling. The separate grades of emotional life are represented in the phylogenetic and ontogenetic evolution of the nervous system, and dwell within us as relative self-appointed values, but are the oldest original instincts, the most deep-seated and powerful, the most prized acquisitions later.]

The sharp distinction between sensation and emotion (sensation and sentiment proceeds from Bichet ("Vie organique et Vie animale") and Schopenhauer ("The World as Will and the World as Idea"), and is crystallized in general by later authors (Herbert Spencer, Helmholtz, Wundt and others), although the definition of these two modes of sensibility is not taken up in corresponding manner. Physiology must still reckon meanwhile, as already indicated, with modes of sensibility which come only through motor, that is, proprioceptive, activities, to expression, and which are not "perceived" in the narrow sense of the word. In such activities also is located the world of the reflex, the reflex arc, and coördination (automatism). From these "sensible" activities, the individual "perceives" only that which is necessary for his individual life economy and daily life; that is, the conscious final result of the relative stimulus modifications. And this happens in a manner that is quite distinct, in part, from the physiological structure and from the central localization. In general, one can say that nervous activity equipped with stable components of place and time, as well as with the subjective causality, belongs to the world of sensation (the world as descriptive), from which our intellect takes its rise. The activity which is independent of space and time, and characterized by subjective qualitative values and blind craving for action (will) must be considered within the world of emotion (the "World as Will," inner reflection of this). The finer differentiation of the emotions was first taken up by Kant. Morality belongs more to the world of emotion than to the world of sensation. Sensation and perception are accounted more in the domain of physiology, but emotion at least in its truly subjective components is assigned to the domain of psychology, and with these two, neurology is concerned.

SUPPLEMENT

A TENTATIVE ORGANIZATION OF THE EMOTIONS, INSTINCTS AND MORALITY

We shall now consider the more delicate relation between the emotions, instincts, and morality, from the biological aspect. We can divide the emotions of men and animals into two main groups which, like all phenomena in this sphere, frequently overlap: those predominantly physical, and those predominantly psychical.

The former are of ephemeral nature, and usually last as long as the bodily stimulus operates.

A. The "physical" emotions immediately accompanying life.

These are for the most part innate. It is a question here of variation of emotion, appearing daily, perhaps at shorter intervals, being periodic and closely connected with the immediate preservation of life, and which, after satisfaction, lapse immediately into an obscure, mostly quiescent latent state. We include also such as accompany the primitive, innate stimuli of the sensory surface (somatic emotions), if such stimuli threaten our life interests or our organs and bodily parts, or advance them effectively. Emotions collectively represent "tensions" which demand discharge as swiftly as possible. Those emotions, that is, the periodic emotions, are dependent on the condition of the blood at the moment, on the glandular secretions, (with discharge of glands that have acted up to their capacity). These emotions, according to the character and source of the stimulus, are of such a nature as in part warns, cautions, and guarantees safety, and in part craves satisfaction. Without exception, they allow the following phases to be distinguished.

(a) The preparative phase (phase before the threshold of consciousness).

(b) Phase of manifest (conscious) tension.

(c) Phase of climax.

(d) Phase of adjustment.

(e) Anacoluthic phase and phase of rest.

(f) Translation into the latent condition, and in this, the production of the engramme. All of the phases follow one another swiftly, and overlap one another. The somatic emotions allow the same stages to be recognized, only they appear here to conform with the sensory stimuli, and display the same variations with regard to their duration and intensity, as the external stimuli occasioning

them. Every emotion is provided with a positive or negative stamp (censor) according to the state of the conflict and of its issue.

1. The visceral emotions are, hunger, thirst, satiety, fatigue, general pleasure and sensual enjoyment; then, nausea, the feeling of choking, the feeling accompanying production of secretions, desire for air, shuddering, etc. (unconscious in the new-born; locally sensitive in a manner neither sharp nor definite).

2. Such corticosomatic emotions we can point out as pain, feelings induced by extreme temperature, desire to cough, heat, tickling, desire to sneeze, local pleasure, need for defecation, blinding, bad odors, irritating noise, fornication, etc. They are all provided with very definite local signs.

B. Psychic emotions (conscious and subconscious: proprioceptive, perceived unconsciously).

Latent emotional activities and those reaching manifestation, affects (transient irresistible flaring up of desire, or will). Some and possibly others of opposing nature combined, or ranked one above the other as it were in conditions of resistance, (with a slight excess of one or the other quality) may enter into action even to the point of passion.

1. Innate, elementary instincts: carnal desire, will wish, impulse, especially in the direction of self-preservation and thriving.

This is the primitive will, which is never known to us in detail, and which exists latently in living protoplasm, that is, in the cellular state. In the immediate present (*in statu nascendi*) it is provided in men (and also in animals) with the quality of mirroring itself to itself (consciousness of various degrees). It comes into activity in two forms:

(a) In the form of acquisition of food, or of other acquisitions (if successful with positive indications) and

(b) In the form of personal safety and defense, that is, guarding against danger before injurious signs (if unsuccessful occurring with negative indications); it strives constantly towards restoring the equilibrium, something, however, which it attains only for an instant. Then begins the game anew. This constant striving and willing is life.

The rudimentary will as well as the (unconscious) sensibility are present even in the embryonic stage. It is possible that the whole development is a manifestation of the rudimentary will in the form of the *mneme* (R. Semon). In any case, this will is already present and operative in the lowest organisms.

Through the mneme (formation of engrammes, temporary differentiation of these according to their value for the economy of life, under temporary inhibition or exclusion of what is foreign to the purpose, the development of the ecphoric manner of stimulation, etc.) and particularly under the influx of the world of sensation (in distinction to the emotions) and of motion, the primitive instincts undergo a more or less distinct organization according to purposes which are of special vital importance (in the broader sense of the word). The future life (of the individual) gains greater importance and the past (the earliest experiences of the individual) gains more power in the development of the emotional life (especially of the higher life interests) in the present and future. The whole material of psychic phenomena (sensation, perception, emotion, in their reciprocal influences and successive blendings) that is, the life interests can be arranged naturally, with special consideration for the objects to which they are devoted, in the following categories:

(a) The true self-preservation of the single individual (true only for infancy).

(b) Maintenance of the species, or sexuality (libido, sex).

(c) Maintenance of the tribe or the more limited group (love of home).

(d) Relations of the individual to all humanity, and to the world in general (infinity, eternity, fate, God, etc.).

In each of these categories, which, in the child, evolve in a very definite order of succession (first the phase of self-preservation, etc.) are to be distinguished in the adult:

1. Innate emotions in the stage of the immediate present; *in statu nascendi*, (original tensions of a primitive sort, which presume no previous experience).

2. Emotions arising in the immediate present, along with which, however, experience also plays a rôle, and wherein the future is already taken into consideration.

3. Complicated emotions in latent state, in labile equilibrium (with excess of emotion now of a positive, now of a negative character).

4. Permanent latent states. Ethical derivations and values, objectivity in the sense of a like attitude to like phenomena in our fellow men. Virtue and vice.

Parallel with these phases founded on abundant experience, there is also a perfection of the more delicate morphological conditions in the cortex.

I. SELF-PRESERVATION

Emotions of different grades with a positive stamp (growth).

1. Cheerfulness, pleasure, interest, wish for safety urge to activity wishes.

2. Surprise, hope, belief, expectation, anticipation, cupidity, more precise wishes, pluck, curiosity, (and also transformation of a failure into a success, longing for repetition of a success). The future is anticipated in a pleasureable sense.

3. Delight in power, audacity, diligence, the drive toward acquisition and the drive towards possession, towards keeping what is acquired. Securely and safely begetting in life.

4. The fully developed individual character; joy in combat, perseverance, strength of will, courage, self-restraint.

Emotions of grades clearly distinguishable with a negative sign (insult, warning).

ad. 1. Fatigue, apathy, anxiety, pain, anguish, suffering, despair, indignation, repugnance, refusal, impulse to flight, etc.

ad. 2. Fear of sudden attack and of being caught unaware, impulse to escape evil. Hopelessness, impatience, disillusion, need of protection. The future is reflected darkly.

ad. 3. Sorrow, care, discouragement, negligence, anguish, despondency, doubt.

ad. 4. Timidity, irresolution, cunning, depression, etc.

II. EMOTIONS RELATED TO PRESERVATION OF THE SPECIES (SEXUALITY)

a) Emotions in the stadium of expression: love, desire, passionate impulse towards union (libido), ecstasy, orgasm, masochism, shame, eroticism.

b) Emotions of the immediate present with regard for the past and the future (up to the most intense passion): vows of love, dreams of happiness, longing, impulse to court, desire for domestic happiness and for maternal love, love of children, etc.

c) Unstable latent state, amorousness, continuing married love, satisfaction with married life, joy in maternal duties awaiting one, etc.

d) Character: sexual honor and faith. Care for posterity, accomplishment of matrimonial and educative duties, sensuousness, ideal disposition.

a) Aversion towards sexual interests, frigidity, repulsion, sexual satiety, sexual hatred, anger, disgust, indifference.

b) Sexual disinclination, contempt for faithless partner, jealousy, disgust towards intercourse, fear in anticipation, psychic impotence.

c) Remorse, grief for the loss of a loved one, sexual jealousy, fear of faithlessness, happiness betrayed, hatred, lack of sexual satisfaction, unfulfilled hope of pregnancy.

d) Faithlessness and lack of honor, inconstancy, sexual shame, hatred towards offspring and towards parents, fear of pregnancy (before the child), maternal negligence, etc.

III. INSTINCTS AND EMOTIONS IN THE STRUGGLE FOR THE PRESERVATION OF THE GROUP, AND FOR THE VICTORY OF THE INDIVIDUAL IN THE GROUP.

a) Innate emotions or early acquired emotions, reaching expression in the immediate present.

(Periods of existence: latent, state, tension, climax, decline, transition into the latent condition. Latent after effects.)

(With a positive stamp)

Love and interests (patriotism, charity), emotion towards the group ("herd instinct"), feeling of group unity and good fellowship and impulse towards the stimulation of these allied social pleasures, love of combat, courage, enthusiasm for common interest, reverence for the higher things, collective and individual love of power, gratitude, public rejoicing. Reaction: alliance, conflict, assault.

(With a negative stamp)

a) Shut-in character, anxiety for the mass, fear of a surprise attack, exhaustion in conflict, intimidation, by another, antipathy, personal opposition, hostile emotion, aversion, refusal, rage, fear, anger, indignation, fright, fury, love of pursuit. Reaction: self-defense, flight, self-concealment, disguise, or the feigning of death.

b) Emotions becoming manifest step by step through capitalization of the past, consideration of the future.

1. Longing for friends and companions, universal defense and attack, peace, victory, pride, desire for praise. Reaction: collective and individual attack, work and other undertakings, protective measures, etc.

1. Mortification, humiliation, regret, disappointment. Boasting, sense of blame or guilt. Regret, remorse, menace and threat, censure, warning, ill will, hatred.

c) Unstable latent condition with a tendency to successive high tides of emotional currents (even to passion itself), of a positive or negative nature in relation to individual persons.

Affectivity (love, comradeship), emotional attitude, mood (tranquillity, happiness, contentment), the feeling of deliverance, reconciliation, gratitude, admiration, self-respect and conceit, expansion, peace of mind, atonement, praise, ambition.

Sense of guilt, depression emotion, evoked by punishment, regret, feeling of repentance, pangs of conscience, anxiety. Loneliness, seclusion, sense of injury, sense of persecution, fraud, insult, disgrace, violation of honor. Hatred, resentment, bitterness, futility.

d) Character and morality (provided with a symbol). Permanent derivations from experience. Creation of ethical values ("ethical engrammes"). Secondary latent conditions of the emotional life (counter-currents included), etc., from which it is conceived continually in the present. Virtue and Vice.

(With a positive stamp)

Goodness, generosity, sense of honor and reputation, friendship, fraternity, partnership, uprightness, ambition, sense of duty, loyalty, modesty, obedience, responsibility, honesty, perseverance, application to work, enterprise and disposition for business, good will, benevolence, love of braver, freedom, fair play, compassion, pity, brotherly love, reverence, respect, love of truth, public service, right and justice.

(With a negative stamp)

Hostility, indifference, vanity, arrogance, faithlessness, sham, pretense, cunning, fraud, violation of justice, envy, ingratitude, cowardice, cruelty, servility, feeling of inferiority, evil, spite, malice, baseness, infamy, avarice, vileness, ill-will, greed, selfishness, vindictiveness, pleasure in inflicting pain, moral apathy, impulse to destroy, peevish disposition, loss of conscience.

IV. PRESERVATION OF MANKIND (HUMANITY) AND CULTIVATION OF RELATIONS TO THE WORLD AND TO GOD (ACQUIRED EMOTIONS)

a) Humanistic and religious emotions coming into Expression (reaching ekphonic).

Inner religious composure, adoration of the Highest, bliss, fervor, rapture, glorification, gratitude towards the Highest, God and Nature worship, inner illumination, religious ecstasy.

Indifference, swearing, emotional conviction of being damned, psychic pain, self-reproach, up to overwhelming contrition, dread, anticipatory fear, foreboding of misfortune, anxiety for the dead and the destruction of the world, etc. Despair, horror, obstinacy. Feeling of loneliness and of being forsaken, indignation, depression, pessimism, compulsion to suicide, pangs of death.

b) Expression of these emotions in relation to the future.

Belief, confidence, hope, impulse towards giving up difficult tasks and resolutions, reward, longing for deliverance, duties towards our contemporaries.

Hopelessness, doubt, fear of punishment, presentiment of coming disaster.

c) Unstable latent condition with a tendency to affective currents.

Psychic peace, joys of love, harmony, salvation, clear conscience, innocence, emotion toward forgiveness of sins.

Gnawing conscience, dejection, psychic pain, melancholy, doubt, ungodliness, grief, discontent, life-weariness.

d) Character, ethical conceptions (Virtue and Vice).

Altruism, innocence, charitableness of heart, striving towards the good and true, impulse towards ethical perfection and purity, impetus towards artistic expression (painting, music, poetry), desire for knowledge, the urgent need of explanation (science, religion, etc.).

Moral apathy, religious indifference, negativism, silence, perversion, impulse towards destruction and search to kill, vengeance even to annihilation of hostile symbols and artistic productions, religious antagonisms, degeneration.

(To be continued)

SOCIETY PROCEEDINGS

NEW YORK NEUROLOGICAL SOCIETY

THE FOUR HUNDRED AND FIFTH REGULAR MEETING, MAY 1, 1923,
DR. E. G. ZABRISKIE, PRESIDENT, IN THE CHAIR

SUBDURAL EFFUSION AND HYDROCEPHALUS

DR. WILDER G. PENFIELD (by invitation) presented the case of a little boy who had developed evidence of increased intracranial pressure after otitis media. This had progressed to blindness on admission to the Presbyterian Hospital. By means of cranial pneumographs, pressure determinations and chemical and cystological study of the fluids, it was determined that there had been an effusion of fluid into the subdural space, and that perhaps secondary to this, there was a moderate degree of ventricular dilatation. As a result of successive dural punctures the vision returned to a large extent and the other evidences of cerebral compression disappeared. The speaker suggested that subdural effusion would explain the not infrequent association of otitis media with papilledema.

Discussion: Dr. C. A. Elsberg said: The case presented by Dr. Penfield is a very interesting one from a number of standpoints and certainly of extreme rarity. Subdural effusions are rare excepting after trauma, and an effusion as a result of an inflammatory process is certainly very rare indeed. The x-ray pictures presented by Dr. Penfield showed very beautifully the extent of the subdural effusion and also that the ventricular system was open. The case is also very interesting from the standpoint of the blindness. For years I have been telling students that, if an individual is blind from papilledema, the vision can never be restored. I have tried to save some vision by early operation, anywhere from four to twenty-four hours after the complete loss of vision had occurred, but have never been able to do so. As a result I was accustomed to say that a patient once blind from papilledema was always blind. Very recently, however, I have had a patient who was entirely blind from a papilledema but in whom considerable vision returned after removal of fluid by ventricular puncture. Dr. Penfield's case is another one of this kind. Therefore, I think my opinion as to the hopelessness of loss of vision from papilledema will have to be revised. Dr. Penfield's case shows also how much information can be obtained from a careful study of the x-ray plates after air injections, and he is to be congratulated upon the careful study he has made.

Dr. I. Abrahamson said that it was very likely that in this case the blindness was not due to the papilledema but to collections of

fluid covering and affecting both calcarine areas. The child appeared to have hemianopsia at the present time.

Dr. W. G. Penfield (in closing) said: It is very difficult to be sure whether or not hemianopsia is present in a child of this age. His mother has noticed that he holds objects up to one eye for inspection in preference to the other. The corresponding optic disc is less pale than that on the other side. I have assumed that this explains his movements rather than any hemianopsia.

ADDRESS OF THE PRESIDENT-ELECT OF THE SOCIETY

EDWIN G. ZABRISKIE said: In this present-day world of constant endeavor to increase efficiency in all directions, but chiefly along the lines of production, we at all times encounter the efforts of the medical profession to contribute its share in the work, not only by improving the health of the individual but also by preventing disease states. That we as neurologists and psychiatrists come in for a heavy share in the responsibility of preventive medicine can not be doubted if one stops to consider that to-day there are 250,000 patients in hospitals for mental diseases in this country; that 50,000 are admitted to these hospitals annually; that the cost of maintenance for those suffering from mental diseases is about \$75,000,000 each year, while the economic loss to the United States each year on account of mental disease is over \$200,000,000. These figures, mind you, do not include the vast number of feeble-minded, whose relative frequency in the state of New York alone is 1 to 200, nor those rendered economically unproductive by reason of pathologic personality traits, chronic instability of the nervous system, psychoneuroses or epilepsy. Neither is it necessary to more than mention in passing those affected organically through occupations in the different industries of the land.

Before the war, our most intensive thought was applied chiefly to the problems of prophylaxis, treatment and custodial care of the insane, the feeble-minded, the delinquent and the criminal. Years of patient effort had succeeded in enlisting the sympathetic coöperation of public minded men of diverse occupations and intellectual training, for the purpose of attacking these problems, because of the social economic wastage they represented. A very comprehensive program for intensive study of the situation throughout the country was inaugurated by the National Committee and gratifying results had already been obtained. The entry of the United States into the war, however, interrupted this program temporarily, but its loss was more than offset by giving us a magnificent opportunity to arouse the attention of the community at large to the great numbers of young men eliminated during our hurried assembling of soldiers, because of pathologic constitutions or temperamental instability as well as organic nervous disorders, which rendered them unfit for military service. We are now beginning to profit by this lesson, for we realize as never before the almost staggering proportion of unstable individuals in this country, many of whom never reach

custodial care, but who nevertheless represent a tremendous decrease of steady production, who at least in episodic reactions, are potentially insane or are potential criminals. These facts have been accorded due significance in the economic and etiologic problems of neuropsychiatry and are furnishing a still greater stimulus for the prevention of disease.

One might say that it was hardly necessary to formulate so obvious a truism that the proper place to begin the investigation of the preventive side of the problem is during childhood, since science teaches us to search the very beginning of all morbid processes for their causes. This has long been the practice in the study of insanity and of criminology, especially since we have undertaken the investigation of personality make-up, as a glance at the treatises on mental diseases and the studies in juvenile delinquency and truancy will confirm. But now an imperative demand for a more searching investigation of the milder conduct disorders and maladjustments of childhood, the nervous child with tics, speech defects and other evidences of instability becomes manifest, and to-day we see an extensive movement under way in many widely separated parts of this country, which embraces the study and treatment of all functional nervous disorders of childhood, and covers a field the limits and possibilities of which are almost boundless. Problem clinics, mental hygiene clinics for children, school clinics, clinics connected with the courts, are springing into existence from coast to coast, and we can foresee the foundations laid for a composite picture of the abnormal individual from childhood on, which will perforce include the anthropomorphic, physiologic, personality and emotional make-up, the environment and all other factors which might influence the development of the individual.

Even some of the psychologists are beginning to recognize that other factors than intelligence quotients are necessary for the complete understanding of the individual. Thus in 1914 Wallin suggested that "Just as soon as a child shows evidence of abnormality, incorrigibility, etc., he should be examined by a psycho-educational clinic which should also afford a medical, hereditary and sociological examination."

The schools furnish a wonderful opportunity for study of these abnormalities either by the group method or individually. The observations of A. J. Pillsbury that 90 per cent of criminals begin their careers as truants shows what a wealth of material we have practically at our door. On a conservative estimate, from 2 per cent to 4 per cent of retarded children in the schools are idiots, imbeciles, morons, border cases, epileptics, neurotics and psychoneurotics. From 15 to 30 per cent grade all the way from borderline or seriously backward to merely dull or slow progress pupils. Fully one-third are pedagogically retarded when measured by age-grade standard, and about 2 per cent suffer from some form of speech defect. As there are approximately 6,000,000 pupils in the United States the full significance of these figures becomes apparent to those of us who participated in the army eliminations.

Someone has said that one of the most striking if not the most important lesson of the great war was that temperamentally the human race had not changed in any essential feature since the very earliest times. There is much evidence to support the statement and truly we seem to find the same savagery, wanton destruction, wholesale discarding of personal responsibility, mass hysteria among soldiers and civilians alike, that characterized all former conflicts. Furthermore, each nation displayed the emotional reactions that had characterized it since its inception or in other words, ran true to its national form. If the above statement contains the elements of truth, as I surely believe it does, one must turn for its explanation to that elusive combination of so-called primitive instincts, unconscious strivings, inhibitions, impulses, moods and emotional traits that contrive to form what we are pleased to call personality, character or individual make-up. Although long ago Herbert Spencer uttered his belief that the whole of life is an adjustment, a continuous adjustment of inner to outer relations, it is only within relatively recent time that sociologist, psychologist and psychiatrist have turned from the study of groups and their classifications to intensive work on the individual and his reaction to environment. Thanks to the illuminating and clarifying studies of Hoch, Freud, Janet, Bleuler and others, we now have at least a working method of approach to the problems of personality make-up, although it is not the purpose of these remarks to do more than point out some of the current ideas. To be sure they are chiefly founded on behavioristic reactions, at least from the viewpoint of MacDougall, who, as the late lamented Southard puts it, has begun to study man's inner relations as they touch society, and from the viewpoint of the sociologists who are endeavoring to carry society back to certain springs of action in the individual mind. To the MacDougall school, character is the result of habit formation or instincts which are amenable to self-control and self-determination.

The psychoanalysts, while dealing chiefly with psychopathology, look at personality in terms of sex determinism, conflicts, sublimations, repressions, unconscious strivings, organ representation and the like.

A glance at the most recently compiled endocrine charts will show that a definite place is accorded emotional traits, psychic variability and sexual characteristics, whether they be inversions, heterosexual or hermaphroditic features. Some of the more fanciful of this group of specialists have gone the length of constructing personality types; thus we have the hyperpituitary type who is aggressive, precocious, calculating, self-contained; the hypopituitary inferior mentally dull, apathetic, sluggish, with poor self-control, emotionally unstable, easily discouraged. The hyperthyroid: restless, talkative, liable to anxiety states and vasomotor instability. The hypothyroid: dull, apathetic, prone to all grades of depression, thymic. The morally irresponsible with a tendency to drug addiction, homosexual practice, suicide. The gonadal: introverted, shut-in, sex and emotional infantilism or the eunuchoid state. One even attempts to link

the fundamental instincts with the internal secretions. Thus we read that the two most important instincts which in the complexity of their sublimations have created most of the institutions of society, viz., the maternal (social creative), and intellectual curiosity (constructive and acquisitive) are tendencies connected with proper function of the pituitary.

In closest relation to the thyroid are the instincts called, by MacDougall, self-display and self-effacement, exaltation, boasting, exhibitionism or depression, self-reproach, etc. Thyroid activity is also expressed in sensitivity, *i.e.*, the ability to discriminate between different grades of sensation and energy. If poor memory goes with the kind of thyroid inactivity seen in cretins, we may deduce that good memory thyroid is associated with inactivity; it works by increasing the conductivity of the brain.

Again we find exponents of endocrine theories ready to make use of the ideas of Freud, as may be seen from the following quotation of an enthusiastic endocrinologist: "Now all kinds of possible conflict emerge. The child is still bisexual depending upon the amount of internal secretions. The dominant adult of the family, by far the most important of the external factors stimulating or depressing the tendencies of the child, usually possess a fairly fixed ideal of monosexuality which he or she unconsciously seeks to impose on it. A feminine mother will try to make her sons like his father, or if she dislikes him, like her own father or a favorite brother. A masculinized mother will tend to make a sex object out of the son, *i.e.*, feminization, but the boy on the side of his internal secretions may be definitely masculine, *i.e.*, after adolescence he would be (if the vegetative-endocrine mechanisms created by his mother's personality had not slipped into the inside track, so to speak). As a consequence, continual subconscious conflicts between two sets of sex reactions will disturb or ruin his life. So an infant may start out with a fairly balanced endocrine equipment, and yet he may end as an inferior, insane, criminal or failure, directly because of conflicts between himself as one sex type, and his obligatory associates of another mixed sex type. This applies also to the mother-daughter, father-son, and father-daughter relationship."

One of the essentially novel ideas more or less common to the conception of personality just mentioned is the idea of determinism and mutability. Those overturn with one sweep, as it were, the ideas of an immutable personality make-up that might be molded to better adaptation and more harmonious reactions, but still retain its fundamental characteristics unchanged. That we can teach individuals with bad conduct disorders, with bad situation reactions how to overcome their difficulties, how to prevent future recurrences, is well known to everyone. That this can be accomplished more readily in childhood is patent to everyone dealing with this phase of life, but is it possible to materially alter the fundamental traits themselves? Some endocrinologists believe it is possible, and one has said that the determination of the endocrine type during childhood and the pre-

diction of future personality type is one of the developments of the future confidently to be expected.

At all events we are entering a period of research in childhood which should constitute the most extensive biologic laboratory experiment the world has ever seen. It will need many years of painstaking, patient collecting of data before the results can be known and unfortunately most of us present will have passed on without more than a conjecture of what they will be.

At a small gathering not long ago it was my privilege to listen to a highly diverting semi-humorous outline of plans for the establishment of a "parentorium," *i.e.*, an institution controlled by the State to which parents having difficulty in the management of their children could be committed. The basic idea of the scheme was a reformatory—one which had in view the inculcation of a proper sympathetic insight into the real difficulties of childhood. Fantastic as the idea may seem, it nevertheless strikes deeply at the root of many conduct disorders in childhood, as anyone familiar with mental hygiene literature must know. The instance of a mother's despair over the incorrigibility of her little girl, to whom she herself made promises of candy, clothes, etc., as inducements to secure necessary trips to the doctor or dentist or to do something equally unpleasant, but with no intention of fulfilling such promises, and even allowed the child to see her pilfer money from her sleeping husband's clothes is by no means uncommon. Locking a six year old child in a dark closet for half an hour is no way to cure him of his fear of the dark, nor is the practice of holding the thumb of a four year old baby against a hot stove a safe method of correcting thumb sucking. The literature on delinquents likewise abounds with comments on unintelligent handling of children through lack of proper insight, example or energetic measures sufficient to adequately carry out recommendations made by competent persons. Frequently the home environment is at fault, through physical inability on the part of parents who may be ill or frank neurotics, psychoneurotics or psychopaths, not only totally inadequate to handle the situation, but often the most important factors in the creation of these situations. Imagine for instance the possibilities for the production of unhealthy traits in a little girl of eight years whose home life is the constant scene of quarrels between a father who is easygoing, possesses no ideas of discipline, and accedes constantly for the sake of peace and quiet to the whims of a mother who is profoundly egocentric, headstrong, a day dreamer, hypersensitive and periodically addicted to morphine. The case reports of the Judge Baker Foundation abound in such instances merely in delinquents. Our own experience shows that much can be done in clearing up these disorders without thought of altering the personality.

In 1905, in the public schools of Los Angeles, special classes were started for persistent truants. The boys were provided with adaptable men teachers and with curricula more closely adapted to the life interest of the boys. They were given a type of school work

that appealed to their interest and was adapted to their varying capacity. In 1912 there were nine such classes the notable results among which were the following:

(1) No boy was suspended from the special classes; the practice of suspending or expelling boys from public schools practically ceased. (2) The average attendance for these classes for seven years was 99 per cent.

The truancy work of the juvenile court was practically abolished. Before the classes were organized all persistent truants were arrested and haled before the court. In 1905-1906 there was 56 such cases; in 1906-1907 there were 30 cases; after that never more than three a year and one year none at all. Now the schools handle the truants more economically and effectively. If these boys had only been studied and recorded in the light of modern methods, think what a magnificent start on the path of experiment we might have had.

THE WORK OF THE DEMONSTRATION CLINICS CONDUCTED BY THE DIVISION ON THE PREVENTION OF DELINQUENCY OF THE NATIONAL COMMITTEE FOR MENTAL HYGIENE.

V. V. ANDERSON, M.D., Director (by invitation), presented this paper: A noticeable swing of the pendulum is taking place in the application of psychiatry to social problems. For a period of years most of the contributions in this field called attention to the striking frequency of mental disease and feeble-mindedness among the inmates of penal and correctional institutions and offenders coming before the courts. Later, it was appreciated that psychiatry could aid institutions and courts in determining the presence of insane and feeble-minded persons, and this sort of service was supplied. Boston, Chicago, Philadelphia and other cities began to develop psychiatric clinics for their municipal courts. It was recognized that mental disease and mental defect are less frequent among delinquents than had at first been thought; and that many other conditions, both constitutional and environmental, are also to be reckoned with as determining factors in delinquency.

Recent studies made by the National Committee for Mental Hygiene, in connection with juvenile courts and delinquent institutions, have brought to light information of the utmost importance. These investigations and the splendid work done by others are changing our whole conception of the rôle of psychiatry in the field of delinquency. A recent mental hygiene survey in Cincinnati, in which each juvenile delinquent received a careful physical, psychiatric, psychological and social diagnosis, is significant in its bearings upon this question. In a study of the "run of the mine" of the juvenile courts of that city, we found that feeble-mindedness was present in only 8 per cent of the cases; 63 per cent of the children had an intelligence quotient above 80. We did not feel that inferior intelligence had a very important part to play in the delinquent conduct of these children. Serious mental conflicts, mental maladjust-

ments, emotional complexes, unhealthy imagery, various physical disorders, bad home influences were constant factors. Most important influences in the lives of these children were found in the moral, intellectual and religious atmosphere of the home, in character training, parental control and supervision. These factors we believe have much to do with the formation of character and the development of personality and here is the crux of the problem so far as the delinquent child is concerned. Eighty-four per cent of the juvenile court children showed character defects and serious personality difficulties of such a nature as undoubtedly were important factors in their delinquent behavior.

Physical disorders were found frequently and the opinion was justified that the basis and foundation of personality are in the physical organism, and that mental balance and mental health are not possible in the absence of physical health. It was recognized that treatment and ultimate prevention, ever the aims of scientific medicine, seem now to be the dominant aims in the fields of psychiatry. Of the most profound significance in the entire situation is the fact that the great majority of all criminal careers begin in childhood.

In order that the benefit to be derived from the application of the new methods of approach to the problem of delinquency may be made available to juvenile courts, public schools and other agencies in the United States, the commonwealth fund of New York City has undertaken a five year program in the prevention of delinquency. This program is probably the most noteworthy undertaking that has ever been entered upon in the way of striking at the roots of crime and juvenile delinquency. It provides for a joint campaign on the part of four national organizations, each with a specific task. These agencies are the New York School of Social Work, the National Committee for Mental Hygiene, the Public Education Association, and the Joint Committee on Methods of Preventing Delinquency. Mr. Barry C. Smith, general director of the commonwealth fund, is the author of this program. The fund has chosen to concentrate its efforts in the following directions:

1. To develop the psychiatric study of difficult predelinquent and delinquent children in the schools and the juvenile courts; and to develop sound methods of treatment based on such study.

2. To develop the work of the visiting teacher, whereby the invaluable early contacts which our school system make possible with every child may be utilized for the understanding and development of the child.

3. To provide courses of training along sound lines for those qualified and desiring to work in this field.

4. To extend by various educational efforts the knowledge and use of these methods.

"That phase of the program known as section II provides for the creation of a new division within the National Committee for Mental Hygiene, known as the Division for the Prevention of Delinquency. It is charged with the responsibility of determining, through the medium of three clinics, the value of psychiatric service

in the study and treatment of conduct disorders in children. Two of these clinics are traveling clinics and move from city to city, giving demonstrations. They are staffed by psychiatrists, psychologists, psychiatric social workers, clinic managers and stenographers, and will remain from six to twelve months in each city for a demonstration of the methods and technique employed in studying and adjusting delinquent and predelinquent children. Such clinics will concern themselves with stimulating social agencies, courts, schools and institutions to carry out the most modern and effective means of treatment. Following the announcement of this service, requests for demonstrations were made by a great many cities throughout the country. These requests come mainly from public officials and social agencies.

St. Louis was selected for the first demonstration and by April, 1922, a clinic had been opened in that city. Coöperation was shown by the various hospitals, city departments, medical men, probation officers and social workers. Soon after beginning the demonstration in April an advisory committee was appointed composed of judges, medical men, educators, public officials, heads of social agencies and civic bodies in St. Louis. By September, some 60 prominent people, representing business concerns, religious organizations, the medical profession, Washington University, St. Louis University and social agencies had written letters to the Director of Public Welfare urging that he take steps to introduce an ordinance into the Board of Aldermen creating a permanent children guidance clinic in St. Louis, which was accomplished. The workings of the clinic and a report of several cases were given in detail by Dr. Anderson. Each case received an initial study, covering from two to five days. A very complete physical, psychiatric, physiological, educational and social study was made of each child. The interplay of personalities was recorded and efforts made to find there, as well as in the concrete evidence of care or neglect which the home affords, the causes of maladjustment or unhappiness.

When all the facts were in, a conference was held by the various clinical workers concerned in the study and recommendations were made including suggestions for treatment along the main lines, physical, psychiatric, educational and social. A monthly follow-up form was used by the clinic, with frequent consultation, continual checking up of therapeutic methods employed and further studies of the child.

The psychiatric examination outlines and organizes in a systematic way all the presenting symptoms for the purpose of getting at all the underlying causes of psychiatric disorders. It discovers pathological personalities. It excavates for mental conflicts. It analyzes the mental contact. In short, it seeks to get a picture of the child as a whole as a living and adjusting personality, and groups the entire study of the case in such a fashion as to map out a scheme of treatment. A psychiatric study of these children brought out a great variety of mental conditions, mental diseases, psychoneuroses, psychopathic personality, epilepsy, endocrine disturbances, mental

conflict, feeble-mindedness and many and various forms of mental maladjustment which undoubtedly were fundamental factors in the delinquent behavior. The physical examinations disclosed conditions including defective vision, defective hearing, nasal obstruction, diseased tonsils, conditions calling for circumcision, faulty dental conditions, malnutrition, heart conditions, bronchitis, suspected tuberculosis, venereal disease, pregnancy, etc.

Summaries: Two hundred and fifty records show: 74 per cent boys, 25.6 per cent girls; 89.2 per cent white, 10.8 per cent black; 59.6 per cent native born; ages, three to twenty years. In ordinary grades in public schools, 58 per cent; subnormals, 7.6 per cent; 3.4 per cent not attending school. Fifty per cent had been in court more than once and were considered repeaters; 30 per cent had been committed to public institutions, many having served repeated sentences. Approximately 87 per cent gave some evidence of physical disease, physical defect or physical disorders of such a nature as to require medical treatment. Certain striking disabilities were found in marked contrast to general mental level; 44 per cent had a specialized mechanical ability; more than 8 per cent were feeble-minded. Other conditions found were psychopathic personality, psychoneurosis, mild personality disorders, etc. The homes of 76 per cent were distinctly unfavorable to a healthy moral mental development. Sixty-one per cent had been associated with gangs.

In the study of the 348 children in the "run of the mine" of the juvenile court, the most striking contribution was the great frequency of personality disorders found among children who were repeaters.

Conclusions: More than half of the children that passed through the juvenile court showed physical and mental disabilities that are fundamental factors in their delinquent conduct. The disposition of their cases, without an adequate knowledge of the social implications of those conditions, merely invites failure so far as the adjustment of the child is concerned. Certainly intelligent treatment without such knowledge is impossible. While a certain percentage of the children present serious problems, the great majority of them are not to be thought of in terms of the usual medical classifications but as examples of childhood difficulties that have their origin in the home, the school, or other situations in which parents, brothers and sisters, teachers and playmates have an important part.

In the particular conduct of the child we will find the rôle his personality plays in adjusting itself to life's situations. This view of behavior as a personality reaction in the effort of the child to adjust himself to his environment, by no means excludes consideration of the values to be attached to serious constitutional conditions both inherited and acquired. The importance, however, of feeble-mindedness and grossly abnormal mental conditions is not such as we were led to believe from earlier investigations. Real progress will be made through a better understanding of the children's personality and the influences from within and without that mould it and make it what it is. Our studies have shown that practically all

of the delinquent children that pass through the juvenile courts are also public school problems. Effective preventive work means the application of more scientific measures in understanding and solving the problems of the children before they get into court, while they are in the school and at home. [Abstracted.]

Dr. Thomas H. Haines (by invitation) said: These systematic demonstration clinics which the Division on the Prevention of Delinquency of the National Committee for Mental Hygiene is stationing in various cities I regard as outposts for the demonstration of what the social engineer, the psychiatrist, can do in the study of the problems of many boys and girls in our large cities. I do not know how many of you realize that of the 250,000 patients in hospitals for mental diseases in this country, and of the 50,000 who enter these hospitals every year, a great number of them come to these hospitals under very different conditions from those that prevail in the state of New York.

As I think of these patients, I see a post-febrile case, a woman who has suffered from typhoid fever, pacing up and down the cell of a county jail. Her husband stands outside the cell trying to converse with her. She does not recognize him. She is hallucinated and delirious. While she had typhoid fever her husband could command for her the services of the best medical talent and the best nursing service in the country. Now, because she is "beside herself," because the toxin engendered by the typhoid bacillus had poisoned some of her cortical cells and she is unable to exercise ordinary self-control, she is locked up in the county jail and deprived of all medical and nursing service. She is in the care of the sheriff. Should she have been admitted to the state hospital, she must by law have been carried thither by the sheriff unless perchance her husband would have taken her. A large proportion of the female patients in these institutions have been transported by sheriffs. Sometimes such a journey is of some hundreds of miles and necessitates a night on a Pullman car or in a hotel. In many of our states it is necessary that the patient be "accused" of being insane and be tried by a jury before a court prior to commitment to a hospital for mental diseases. Six men, courthouse parasites, go to the jail to see such a woman and to decide whether she is "sane" or "insane." A more pathetic travesty upon justice cannot well be imagined. Yet these anachronistic procedures are in vogue in thousands of our communities.

Who is responsible for this lack of appreciation that the mentally ill are sick persons and should be treated by doctors and nurses? Possibly the medical men in these communities, did they but realize the possibilities of their own practice in such cases, could bring about desirable changes.

These clinics are demonstration outposts. They will shed forth light. They will help people to understand what medicine can do for mental disease, as well as for perversions of personality and character. Every one of us has known more than one boy like Gabriel, described by Dr. Anderson. Many of us know that in

communities less favored than St. Louis such boys do not get square deals. There are large sections of our country in which there are no such clinics for the analysis of personality and diagnosis of pathological mental conditions. These carefully organized clinical teams of psychiatrists, psychologists and social workers proceed with the human problems much as does the engineer who takes in hand a problem of irrigation and water power development. He studies the rainfall, the stream flow and the forestation of the region in which he is interested. So these clinics study the organization and the pathology of personality.

I believe that in every city, to which one of these clinics goes and makes a successful demonstration of the service to be rendered by such students of human nature, the service will be made a permanent community asset. I also believe that its influence will reach out over the commonwealth in which the city is located. Such useful analyses of mental pathologies will make their appeal in the country districts. The demonstration that the mentally ill can be helped by doctors more than by lawyers and sheriffs will reach ultimately to all our legislatures. These clinics will be the means of bringing about a decidedly modified and enlightened appreciation of community responsibility in the field of mental maladjustment.

Miss Elizabeth Farrell (by invitation) said: The type of work described by Dr. Anderson, with modifications that we know to be desirable, has been carried on by the Board of Education of this city for the past twelve years. The work is organized in the Department of Ungraded Classes. The personnel includes psychologists, social service workers, psychiatrists, physicians, and educators. We believe that the problem presented by maladjusted children is one that requires modification of school environment from the point of view of subject matter, of instruction as well as methods of its presentation. Education is a science as well as an art. It offers a field for study and investigation that engrosses the entire time of scientific men and women who have chosen education as their field of endeavor. The modification of school environment, of school work and of method cannot be properly advised by persons expert in allied fields whether of medicine, social service or psychology. Special education is the proper function of the trained educator, who has available the data which psychology or psychiatry or social service make available on any particular case. This is the major difference between the work carried on by the Board of Education and that described by Dr. Anderson.

The extent of the work in this city will come as a surprise to many of you. During the present school year which opened on the second Monday of September last, there have been held 470 clinic sessions in various parts of the greater city. The clinics are held in a locality where the number of problem children warrant it. The clinics are of two types. Stationary clinics maintained at headquarters in Manhattan and Brooklyn, and traveling clinics in different localities throughout the greater city. These clinics are maintained for children who present problems of retardation or behavior.

These groups include truants, the emotionally unstable, the neurotics, the psychopaths and physically defective as well as many other children who vary from the normal.

The children who are examined at the clinics are selected in two ways. We get many such children as Dr. Anderson has discussed, who present serious problems of maladjustment. Their difficulties, of course, are of long standing. They are a matter of growth. Their management is very difficult because of the prolonged growth which antedates the particular occurrence which has focussed attention upon the individual. The habits formed during the period previous to his appearance at a clinic have become an integral part of the personality. To eradicate them is difficult if not impossible. Because of this fact we have developed a technique which brings to the surface children of the type that need attention before the maladjustment has become ingrained. By means of objective measures of entire school units, we are bringing to light the problems of a great many children, at a time when it is relatively easy to redirect energy and effort along lines of positive values. This method of understanding the pupil group in any school unit has been tried in twenty-three of our elementary schools. We find that this study of a school unit brings to light not only those children who are problems to others, the case of Gabriel presented by Dr. Anderson illustrates this type of case, but we get also those children who present problems to themselves. This group conforms to the established order, makes every effort to coöperate, but because of ideals that are unattainable for them, they are waging an unsuccessful battle, they are building up attitudes and habits of failure which they must carry through life. By means of these objective measures and intensive study we are selecting gifted children who under ordinary conditions in the schools develop habits of superficiality and dishonesty because school life does not compel them to tap all their resources in order to overcome the obstacles of their environment. We have worked long enough in the schools of this city along the lines suggested by Dr. Anderson, as well as along those lines which we believe to be more comprehensive, to know that it pays. Truancy has not existed in those classes where subject matter and method of teaching have been adapted to the needs, capacities and constructive activities of children.

The principal of a large elementary school in one of the densely populated foreign colonies of the city is responsible for the statement that the problem of bad conduct, which in the past has made school discipline an important factor of school work, has entirely disappeared since the pupil group has been reclassified. She says, further, that she had not anticipated any such result. It came to her as a complete surprise after the reorganization had been in working order about two months.

My particular contribution to this discussion may be stated as follows: educational clinics must not only attempt to cure sick children, but they must prevent the development of maladjustments. This can be done best by educational clinics which are an integral

part of the public school system. Such clinics are regarded by parents, teachers and other workers with children as scientific stations where children are studied in order that delinquencies may be prevented; that success may crown the efforts of children; that their positive self-feeling may be conserved; that habits of failure and feeling of inadequacy may not be developed; and finally that the work of the school may be as beneficent as it is efficient.

Dr. L. Pierce Clark said: I fully approve of Dr. Anderson's work in all its bearings. Beyond the immediate practical value of Dr. Anderson's results is the highly important effort to solve what may be done to modify human nature either in its inherited or acquired pattern. This larger problem is usually embraced under what we designate as *personality*, while *character* is the term that perhaps may be limited to the uses to which this innate personality is put in the process of life adaptations. Personality perhaps may not be changed, or only so slightly as to be negligible, while character lies at the very core of our social adjustment and may be signally changed, with the beneficent results which Dr. Anderson has already reported.

Dr. Sanger Brown, 2d, said: In correlation with Dr. Anderson's work I wish to speak of some other interesting studies which Miss Theis of the State Charities Aid Association of New York has been making. She has records of about 950 children who have been placed out in homes by that society. These children all came from very poor homes. They were either orphans or destitute children and their parents were for the most part irresponsible people. From the standpoint of heredity it is very interesting to know how these children have turned out. Miss Theis' findings indicate that despite their bad or uncertain heredity these children are not very different from children from normal homes. Many of them have now reached the age of eighteen years and over. There is not a high percentage of insanity among them; there is not a high percentage of mental defect, and there are not many delinquents in the group. Most of them belong to the artisan class and they appear to be industrious and law abiding. This is a hopeful aspect of this whole problem of child welfare in the case of dependent and neglected children.

Dr. S. R. Leasy said: We surveyed 1600 children at the Protectory last summer. We found that, according to intellectual percentage, 85 per cent were of average intellect, about 5 per cent were subnormal and the rest of the group superior. We also found that third offenders were all practically four years or more back in grades. These offenders had apparently not profited by one or two admissions to the institution. Of course with such a large group it was almost impossible to study personality or get family histories. I think the background has a great deal to do with it. We will have to study and correct same, if possible. I feel that Miss Farrell is correct and that school is the first adaptation. The child is forced to meet others outside the family. Here he feels that there are other children who have rights. If he is successfully placed here, it will be a real prevention of further defects. It is only after unsuccessful meeting of

school situations that difficulties develop. I feel that definite and proper placement from the beginning of the school life will occupy the proper interest of the child who will fit in very definitely with either of the large types—the superior, average or the retarded.

Dr. V. V. Anderson (in closing) said: I am sorry I could not have time to read some of my statistical matter. As regards the school as the location for the clinic, I may say that we have one clinic now demonstrating in the school system. This clinic that I speak about embraces children in the juvenile courts or public schools. Thirty or forty came to the clinic because of truancy. In no case did we find this as the most important. As regards Miss Farrell's remark about checking up: We have one clinic for the past year studying schools in a public community. They are studying the school methods of the child and the physical study of every child. A report on this will soon be out. It shows the study and checking up of many children. The schools are the location for a clinic. I think the question is that every large city needs clinics in schools, also the juvenile courts need them. In smaller cities it has been my habit to advise community clinics and that juvenile court clinics should not be neglected. These have been of real service to a large number of parents who have problem children of three, four and five years of age. I think community clinics are the ideal thing for smaller cities. They should encourage parents. Contrary to what Miss Farrell says, it has been my experience in small cities that parents come in large numbers. It has been my experience that we have had most difficulty to get parents to help on account of their fearing that teachers would know private conditions of their life. Our records, however, are always purely confidential.

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

REGULAR MEETING, MAY 17, 1923, F. K. HALLOCK, M.D., IN THE
CHAIR

THE DIENCEPHALIC CENTERS CONTROLLING THE ASSOCIATED LOCOMOTOR MOVEMENTS

DR. HUGO MELLA read this paper: One of the striking signs appearing early in many cases of paralysis agitans is the loss of the normal automatic, associated movements. In walking, the normal quadruped alternates the movements of the legs by associating the left fore with the right hind, and the right fore with the left hind; in normal man we see the identical coördination between arm and leg movements. If a typical case of paralysis agitans is observed, it is seen that the arms are carried with the trunk and do not swing in coördination with the contralateral leg. That this is not due to the rigidity of the arms is obvious, because many cases presenting this sign are not rigid, merely having the tremor and mask-like features characteristic of this syndrome.

The literature on automatic associated movements is indefinite and largely clinical. The papers published by those who have studied the basal ganglia experimentally, merely mention the presence of alternate walking movements in their preparations when these are observed, but make no attempt at a definite localization.

In view of these observations it was thought that a series of ablation experiments on the basal ganglia might lead to a more definite localization of this function and thereby throw more light upon the pathology, mechanism and physiology of the Parkinsonian syndrome. The method of investigation was described and a brief abstract of protocols presented with a statement of the technique pursued in studying the material. As a result of these experiments the following conclusions were drawn.

This series of ablation experiments on cats seems to show that in the subthalamic region is found an area which, when removed, causes the cessation of the automatic, locomotor movements associating the fore and hind legs. When this area is left intact in decorticate preparations these movements are present. Serial transections with observations on the locomotor movements, show that the area controlling this function lies from 5 mm. to 10 mm. cephalad to the tentorium. Here the only structures found consistently are the body of Luy's certain characteristic motor cells.

Discussion: Dr. C. Macfie Campbell: When you stimulate that area in which you get these movements, do the movements keep on longer than the period of stimulation, or, are there only one or two movements?

Dr. Mella: We do not stimulate the area directly. After anesthesia the animals are allowed to recover, and almost any stimulation will induce the movements, such as twisting the tail, tickling the foot, or stamping on the floor. Electricity was not used.

Dr. H. R. Viets: How far, roughly, are the cells of Luy's from the red nucleus?

Dr. Mella: Roughly I should say that they are about 5 mm., that is the least distance that we find any; most of them are about 7 mm. cephalad to the tentorium. We do not find any within 5 mm. There are really very few there; probably one could pick out one or two from the sections but they are difficult to locate that far caudad. In higher sections one can locate them quite readily.

Dr. Viets: In work done in Sherrington's laboratory, we made about 150 decerebrations without paying any particular attention to the level, but surely in over half of them we got automatic movements; whether we always saved the cells of which you speak I am not sure. A good many showed the red nucleus on the surface of the section.

Dr. Mella: It depends on how one makes the section. I have attempted to bear this in mind so that the angle of transection would be practically the same in all of the experiments. If this is not considered one might make the error of transecting at the tentorium above and terminate 10 to 15 mm. cephalad to it inferiorly. Of course, some of our sections were found to vary a little. We tried to have as

little hemorrhage as possible. We had to make a large number of experiments before we obtained good material to study; of these we saved about 20 of the best to work on. If it is done too roughly, hemorrhage will spoil the section. There are a good many steps—the ligation of the carotid, etc., that I have not gone into. I wish to emphasize though, that the automatic associated movements of which I have spoken are not between just the fore or hind but between all four legs.

Dr. Percival Bailey: In the course of experiments on the influence of the cerebellum on decerebrate rigidity, I had an opportunity to observe some phenomena directly bearing on the presentation of Dr. Mella. These experiments were done by Dr. Frédéric Bremer in the Laboratory of Surgical Research and I had the pleasure of doing the surgical work with him. They will be found described in full in the *Archives Internationales de Physiologie*, Vol. 9, p. 189, 1922. He noted that a certain optimum tonus is necessary for the production of rhythmic progressive movements. Now the simplest explanation of the results of Dr. Mella would be this: as the section passes farther back the tonus increases above the optimum for progression reflexes and only the extensor rigidity is seen. If, however, the tonus is reduced either by chilling of the animal, slight asphyxia, stimulation of the cerebellum, or otherwise, the progression reflexes may reappear even though the section passes back to the red nucleus.

Dr. A. Forbes: I think sometimes you can get progressive alternate movements with decerebration which has passed 5 mm. in front of the tentorium. A rough decerebration at one point may cause trauma enough to knock out the functional capacity of cells a few millimeters away. In general, if you make a section at the tentorium you get motionless rigidity. You sometimes get sprawling movements after transection even pretty close to the tentorium. Just where the dividing line is I cannot say.

Dr. Stanley Cobb: One point we ought to remember; that is, that in these experiments we were interested only in the association of the progressive movements of all four legs. In spinal preparations we may have alternate movements of one pair of legs perfectly well; and in spinal preparations you may have alternate locomotor movements during periods of stimulation. In these animals, however, the alternate movements of all four legs, in a regular rhythmic progressive reflex, were spontaneous and lasted for a long period.

QUADRANTIC MUSCULAR CONTROL BY VESTIBULAR APPARATUS

DR. C. L. WOOLSEY read this as a preliminary report on the result of experiments on the vestibular apparatus of the pigeon.

Bodily movements may take place in a horizontal or a perpendicular plane, or in a resultant of both planes. Horizontal movements may be linear movement forward, backward; to the right, or to the left. Perpendicular movements may be upward or downward,

in the right anterior quadrant (R. A. Q.), in the right posterior quadrant (R. P. Q.), in left anterior quadrant (L. A. Q.), or in the left post-quadrant (L. P. Q.), or the resultant of movements in any two contiguous quadrants. Experimental lesions of the vestibular end organ or its pathways, produce certain muscular reactions, which in all probability are due to a disturbance in muscle tonus. Lesions of the vestibular end organ, or its pathways, may be stimulating or destructive. Stimulating lesions may be produced by mechanical, electromechanical, thermal, or chemical means. Mechanical stimulating lesions have been accomplished by gently inserting a horse hair or an enameled copper wire, .0035 in. in diameter, into a fistula in a semicircular canal and thence to the vestibular end organ.

Electrical stimulation.—The field of operation is prepared, and the canals exposed; anesthesia is suspended until the pigeon recovers consciousness (profound anesthesia masks movements from vestibular stimulation), then a fistula into a semicircular is made, allowing the endolymph to escape. The field of operation is thoroughly dried by alcohol, and an enameled copper wire, .0035 in. in diameter, is inserted until certain nystagmoid movements are noted. The wire is withdrawn slightly and the cavity filled with dental cement. By this method the wire is held in situ, and stimulation may be applied with comparative ease. Two or more canals may be stimulated simultaneously.

Thermal stimulation is produced by douching the ears with hot or cold water, or by applying heat or cold over the mastoid area.

Chemical stimulation is produced by injecting solutions directly into the endolymph channel.

Destructive lesions may be produced by a vigorous application of any of the methods used to produce stimulating lesions.

Valuable data in regard to quadrantic vestibular control may be obtained if individual ampulla are destroyed by the direct application of a red hot cautery to the bony ampulla, thereby causing an escharotic lesion of the vestibular end organ contained therein.

Experimental data.—Linear movements forward, backward; to the right, or to the left, are influenced by stimulating or destructive lesions of the end organ of the horizontal canals. The effects of a stimulating lesion are directly the opposite of the effects of a destructive lesion. If a horizontal canal is opened under profound etherization the escape of the endolymph rarely produces vestibular syndromes, but if etherization is suspended, and the pigeon allowed to regain consciousness, the escape of the endolymph is accompanied by nystagmoid movements of head and eyes. The slow pull is toward the opposite side, while the quick phase is toward the operated side. These movements cease with cessation of endolymph flow. If a horse hair or a wire is inserted into the canal and the end organ gently stimulated, a severe tonic muscular contraction takes place, drawing the head to the opposite side, in a horizontal plane. This contraction persists from 2 to 4 seconds, and is followed by nystagmoid movements of the head and eyes; the slow pull to the opposite

side, while the quick movement is toward the operated side. If the lesion is a destructive one (destruction of the vestibular end organ), the nystagmoid movements of the head and eyes will be reversed, that is, the slow movement will be toward the operated side while the quick movement will be toward the unoperated side. The slow movement toward the operated side causes the pigeon to turn toward the operated side. Linear forward flight, at first, is impossible. If both the ampullæ of both horizontal canals are destroyed a fine horizontal tremor is noted and a coarse pendulum movement of the head from side to side. The pigeon turns to either side, and flies upward in corkscrew fashion. Eighteen months after operation the above described symptoms persist.

Movements upward or downward in the R. A. Q., L. A. Q., R. P. Q., or the L. P. Q., seem to be influenced by stimulation or destruction of the ampullæ of the vertical canals.

Stimulating the ampulla of the right anterior vertical canal causes a slow pull of the head into the left anterior quadrant (and vice versa). If the ampulla is destroyed the pigeon topples forward into the right anterior quadrant. Linear forward flight and upward flight are not greatly disturbed until movements are attempted in the R. A. Q., then the pigeon will "side slip" into the R. A. Q. and fall.

Stimulating the ampulla of the right posterior vertical canal causes a slow pull of the head into the L. P. Q. If the ampulla is destroyed the pigeon topples into the R. P. Q., or sits on his tail. In flight he frequently turns over backward and falls into the R. P. Q.

If the ampulla of the left anterior vertical canal and the ampulla of the right posterior canal are destroyed, a rotary pendulum movement will be noted (the head will be rotated slightly upward—the bill toward the right), forward downward through the L. A. Q., into the R. A. Q., then upward and backward toward the R. P. Q. A fine vestibular rotary tremor is also noted. The pigeon topples forward into the L. A. Q., or falls backward into the R. P. Q.

If the ampullæ of the right anterior vertical canal and the left posterior canal are destroyed the movements will be the reverse of the movements in the experiment just described.

A number of patients have been examined in the Neurological Department of the Massachusetts General Hospital who have symptoms comparable to experimental quadrantic vestibular syndromes in the pigeons cited. Several cases of so-called spasmodic torticollis manifest these symptoms, and by caloric tests have shown abnormalities that would strongly point to tract lesions as a probable cause of the peculiar head movements and drawing sensations in different neck muscles.

Conclusions.—Vestibular lesions may be stimulating or destructive. The symptoms of stimulating lesions are the reverse of the symptoms of destructive lesions. Body movements in the R. A. Q., L. A. Q., R. P. Q. and L. P. Q. are influenced by stimulating or destructive lesions of the vertical canals, while lesions of the horizontal canals, or their tracts, influence linear horizontal movements.

Analogous symptoms in humans would lead one to suspect lesions of the vestibular end organs, or its pathways, in a great number of the so-called habit spasms, or spasmodic torticollis, in which quadrantic vestibular symptoms are noted.

Discussion: Dr. Percival Bailey: These clever experiments of Dr. Woolsey are of the utmost importance. I cannot but feel, however, that labyrinthine disturbances must be rarely the initiating factor in torticollis. We recently had a case at the Brigham Hospital which was relieved by intraspinal section of the XIth nerve. In this patient we were never able to see a nystagmus nor any other evidence of labyrinthine disturbance. The case cited by Dr. Woolsey is very suggestive, and it may very well be that in certain predisposed individuals movements of the head and neck of vestibular origin might set the pattern for a habit spasm of this type.

Dr. E. W. Taylor: From a clinical standpoint we have been much interested in Dr. Woolsey's work; although he has not absolutely proved his point, it is interesting that he has at least begun a demonstration of the relation of labyrinthine disturbance to gross muscular movements. Many of these cases of torticollis, by some regarded as psychogenic or partly psychogenic in origin, have actually never been properly explained. He seems to show that there is a connection, and in the case to which he referred there is undoubtedly a relationship between the torticollis-like movements and the disturbance in the labyrinth. As a matter of fact, it is a case which we would formerly have regarded as a beginning of torticollis of the ordinary type without reference to ear involvement. This is work of the greatest practical significance as demonstrating a possible explanation of some, at least, of these hitherto mysterious cases.

Dr. Woolsey: In regard to the origin of the quick phase of nystagmus, I believe that we do not know the mechanism of this movement. There seem to be balancing forces acting through the basal ganglion, vestibular end organ, and the cerebellum, which control muscle balance. I believe it will be impossible to explain the mechanism of the quick and slow phase of nystagmus until we know more about the lenticulo-vestibulo-cerebellar connections.

In deeply anesthetized pigeons the nystagmus is produced with less frequency than in the normal pigeon, which leads one to think the cerebrum plays an important part in the solution of the quick and slow movements of nystagmus.

THE CEREBROSPINAL FLUID PRESSURE IN EXPERIMENTAL EPILEPSY

DR. MAXWELL E. MACDONALD, of Boston, made a presentation of some preliminary observations on C. S. F. venous and arterial pressure in experimental convulsions.

Thujon, the convulsive agent used, is the active principle of absinth and is generally classified in the camphor group pharmaco-

logically. The exact point of its action is not definitely known although Hildebrant, working on the camphor group of drugs in 1902, concluded that thujon acted on the medulla primarily and the vasomotor center specifically. It is sufficient for our purposes to say that the march of events during a convulsion produced by thujon, is very similar to that seen during an epileptic fit. Within a few seconds after the drug is given intravenously the animal moves in a restless, uneasy manner, and there is a constriction of the pupils and the peripheral vasomotor system. There follows immediately a retraction of the head, tonic extensor spasms of the forelimbs and more rarely of the hind limbs. This is followed by clonic spasms, dilation of pupils, exophthalmos, unconsciousness and loss of control of sphincters. Under anesthesia it is necessary to give a larger dosage but the course of events is similar. In the following experiments ether was given by the tracheal route.

Exp. I—Cat.—Venous pressure apparatus attached to jugular vein and trephine opening made in tempoparietal region, the dura incised, and the hole closed by sealing a funnel-shaped glass attached to a membrane manometer over it. This made a closed system so that any change in the air volume would be registered on a kymograph. Twenty mils of 20 per cent thujon in cod liver oil given intravenously. The first chart shows the marked oscillations of the venous pressure during the convulsion, from 5 cm. to 16 cm. in one convulsion and from 4 cm. to 23 cm. in another. The kymograph record shows clearly the fact that there was a retraction and bulging of the brain.

Direct observations were also made through the trephine opening. Just before the convulsion the brain appeared to shrink and blanch and at this moment the fluid (Ringer's) in a manometer connected with the lateral ventricle, fell to a low point. After the momentary blanching and shrinking the brain surface became congested and swollen, pushing through the trephine opening. At the same moment the fluid in the manometer rose to a high point.

Exp. II—Cat.—In this animal instead of a large opening one just sufficient to admit a needle was made. A manometer was connected directly to the ventricle. Chart II shows the venous and C. S. F. pressure together. It shows a distinct drop in C. F. S. pressure before the convulsion and the subsequent rise in venous and C. S. F. pressure during the convulsion. One part of this chart shows a gradual fall in C. F. S. pressure several times and leads one to think that the respirations in themselves are not the cause of the rise in pressure.

Exp. III—Puppy.—Chart III shows similar changes in pressure, namely a drop before and a rise during the convulsion. Direct observation on this animal showed the initial blanching before and the protrusion with congestion, during the convulsion.

Chart IV and V shows a similar sequence of events with manometer records of cestern pressure.

A kymograph record of the arterial pressure during a thujon con-

vulsion shows that there is a slight rise at the end of the injection. This is very transitory and the pressure gradually drops and stays lower than normal during the convulsion. Following, there is a gradual return to normal level.

Three interesting clinical observations have been made recently during lumbar puncture on epileptics. A sudden drop occurred while the readings were being taken. Immediately following the pressure rose as the convulsion occurred.

Pollock has made tracings of the B. P. during a petit mal attack which show a preliminary rise in B. P. at 26-60 seconds, and a sudden marked drop at 9-12 seconds before the convulsion. The B. P. remained low during the attack. The observations of Foster Kennedy and John Hartwell of the brain of a patient during an epileptic fit showed as the initial sign a sudden whitening of the cortex which was immediately replaced by an extensive venous engorgement with the protrusion of the brain beyond the level of the operative bone defect.

It is interesting to note the fact that in quite a number of epileptics the ventricles have been found dilated. We have produced a slight dilatation of the ventricles in young rabbits by giving them a large number of convulsions over an extended time. It is therefore possible that the enlarged ventricles in human cases are a result of repeated convulsions.

The results of these preliminary observations in thujon convulsions seem to show that there is an initial drop in C. S. F. pressure coincident with the blanching and retraction of the cortex and a subsequent rise during the stage of congestion; that the venous pressure follows the C. S. F. pressure; that the marked oscillations in pressure are not due, entirely at least, to the respirations; that (at least in one case) there is a lowering of arterial pressure. There is some association between these experimental and several clinical observations. The results of the work are by no means conclusive, but are presented only as they point to paths of approach to the problem.

Discussion: Dr. Hugo Mella: I do not wish to strike a discordant note, but I did not find a rise in pressure in the case alluded to by Dr. Macdonald, unless he refers to the rise back to normal after the convulsion. In doing a lumbar puncture on a young man who gave a history of convulsions over a period of two years after discharge from service, while waiting to get a normal reading before any fluid the pressure suddenly dropped and the column of fluid disappeared from the manometer. The patient commenced to move and went through a typical convulsion. I kept my hand on the needle until he came out of the attack, and after the convulsion was over, the pressure came back to its original point of about 150. Throughout the attack the lumbar puncture apparatus was perfectly connected. I think the experimental results of Dr. Macdonald have been quite contrary to this observation. This patient showed typical hysterical attacks of an emotional sort, and the question arises, was it possibly a functional attack, and is there a difference in the

cerebrospinal fluid pressure in the functional and in the idiopathic attack? Might it be something of that sort?

Dr. Percival Bailey: It would be very interesting in these animals to follow the intracranial venous tension, since Becht has shown that the cerebrospinal fluid pressure follows closely the venous pressure.

I have seen patients, during operation on the brain under local anesthesia, go into convulsive attacks without observing any change in the calibre of the cerebral blood vessels exposed.

Dr. Donald Gregg: I have seen conjunctival hemorrhage after attacks of severe epileptic convulsions. Has that occurred in the experimental cases?

Dr. Macdonald: I have never seen conjunctival hemorrhages. In one case after repeated severe convulsions, toward the end of his wild clonic episode, the animal broke his back with a resultant lower paraplegia. Two days later at autopsy a fracture was found at the seventh dorsal vertebra. Besides local injury many small hemorrhages were found in the mucous membranes of the stomach, intestine, and bladder. Whether these were the result of the convulsion *per se* or whether they followed the injury I do not know, but the latter is more probable.

STUDIES IN THE CHEMISTRY OF THE BLOOD IN EPILEPSY

DR. WILLIAM G. LENNOX (by invitation) read this paper: The following constituents of the blood, viz., nonprotein nitrogen, urea nitrogen, amino acid nitrogen, uric acid, creatinine, sugar, and alkali reserve have been determined in a group of more than 100 epileptic patients. Practically all determinations were within the limits of normal. The values bore no relationship to the time or frequency of convulsions. Similar determinations were made on the blood of seven epileptic patients during and following prolonged starvation. Starvation was absolute, except for water, and continued for from 11 to 21 days. All these patients showed remarkable increase of the blood uric acid (from the pre-starvation level of 3 to 5 mg. to a starvation peak of 8 to 16 mg. per 100 c.c. of blood). This increase was found to be due to a failure of the kidneys to eliminate uric acid. It occurred in a normal individual who underwent a short fast. In one of the patients, at the end of starvation, the nonprotein and urea nitrogen rose respectively to the remarkably high concentration of 300 and 240 mg. per 100 c.c. of blood. It is believed that these great fluctuations in the nonprotein nitrogenous constituents of the blood during fasting have nothing to do with the fact that the patients were epileptic. During starvation convulsions were decreased, therefore the observations furnish additional evidence that in epilepsy convulsions are not initiated by increase of uric acid, nonprotein nitrogen or urea nitrogen in the blood.

Discussion: Dr. Stanley Cobb: Dr. Lennox's work is in the stage of experimentation; the main point of interest now, I think, is that we seem to be able in some cases to stop the attacks by a starva-

tion period. We therefore want to know what happens in starvation in the body metabolism. We are searching along these lines and may eventually reach a possible explanation. One point of interest, as you probably noticed on the charts demonstrated, was the extremely high uric acid. What that means we as yet do not know.

ELECTROMYOGRAPHIC STUDIES OF MUSCULAR FATIGUE IN MAN

STANLEY COBB and ALEXANDER FORBES presented an abstract of their studies.

In neurology and general medicine not enough attention is given to muscle. Although this tissue comprises a major part of our body weight we rarely take into account its great metabolism, nor consider its activity and fatigue. The study of nerve and muscle relationships is still a great field for research. But the study of muscular fatigue is so complicated by psychological factors that a method of accurately recording any of its concomitant phenomena may be of value. The present study was undertaken because it applies a new combination of methods to the study of fatigues in the hope of elucidating to some extent the complex problem.

Muscular fatigue of the flexors of the wrist (principally the flexor carpi radialis) was studied in ten different individuals. In the first eight experiments the isotonic contraction was used. This was accomplished by constructing a large ergograph to which the right arm was strapped. The hand was inserted into a heavy woolen glove thickly coated with plaster-of-paris, so that the finger and metacarpal joints were immovable. This so fixed the limb that motion was possible only at the wrist. A wire was attached to the plaster glove, and this ran over a pulley to the weight which hung below. The action-currents of the contracting muscle were led off by placing nonpolarizable electrodes on the arm; these electrodes were connected with the galvanometer, completing a circuit, and the oscillations were recorded on a rapidly moving film. Besides recording the movements of the galvanometer string on the moving film a lever was so arranged that it cast a shadow on the film, simultaneously recording the mechanical movement of the wrist in lifting the weight. Thus the records of the mechanograms and electromyograms are synchronous and indicate simultaneous mechanical and electrical phenomena. In the last ten experiments isometric muscular contractions were studied. The arm was fixed as before, but the hand was also strapped down firmly, and the subject was told to "pull as hard and steadily as possible" against the immovable strap.

Using the method above described eighteen experiments were performed on ten different individuals. The data obtained are summarized in the following table.

In looking over the data presented in the table, it is seen that two changes in the electromyogram usually appear with fatigue. In the first place the frequency (rate per second) of the action-currents is decreased. Secondly, there is usually a distinct increase in

Experiment	Subject	Time in seconds taken to cause fatigue	Change in frequency of action-currents	Change in amplitude of main waves in per cent	Total amount of work in C. kilos.	Change in resistance in ohms.	
			<i>Per sec.</i>	<i>Per cent.</i>			
1	T.	150	-7.	+127.	688	.....	Isotonic
2	S.C.	90	-4.	+70.	1005	.....	Isotonic
3	S.C.	190	-10.	+51.	1458	10,000 to 10,000	Isotonic
4	A.F.	390	-1.5	-0.	4080	17,000 to 18,000	Isotonic
5	O.	255	-14.	+80.0	2760	.....	Isotonic
6	B.	405	-10.	+100.0	4387	45,000 to 30,000	Isotonic
7	S.W.	330	-18.	+67.	1431	11,000 to 10,000	Isotonic
8	O.R.F.	300	-10.	+183.	3300	11,000 to 10,000	Isotonic
Average		264	-9.	+85.	.....	.....	Isotonic
9A	S.C.	95	-24.	+43.	.....	.....	Isometric
9B	S.C.	60	-20.	+24.	.....	.....	Isometric
10	S.E.H.	120	-7.	+150.	.....	.....	Isometric
11	S.C.	60	-26.	+116.	.....	.....	Isometric
12	H.W.S.	75	-18.	+100.	.....	.....	Isometric
13	H.B.C.	75	-24.	+80.	.....	.....	Isometric
14	S.C.	70	-10.	+75.	.....	.....	Isometric
15	S.C.	65	-24.	+111.	.....	.....	Isometric
16	S.C.	80	-21.	+29.	.....	110,000 to 114,000	Isometric
17	S.E.H.	50	-18.	+56.	.....	96,000 to 103,000	Isometric
18	A.F.	75	-23.	+25.	.....	40,000 to 48,000	Isometric
Average		75	-20.	+73.	.....	.....	Isometric

the amplitude of the waves, indicating that action-currents of greater voltage are produced in the fatigued muscle. This decrease in frequency and simultaneous increase in size of action-currents, which we have observed in fatigue, may be explained theoretically either by assuming "resistance" or partial block to develop at the neuro-muscular junction, or by assuming that fatigue reduces the excitability of the muscle fibers without causing a corresponding reduction of the size of response of which they are capable. Finally, these observed effects might be explained as the result of an increased frequency of discharge of nerve impulses from the motor centers, but since there is no positive evidence in favor of this latter view and much evidence tending to localize the effects of the muscle, this explanation may probably be discarded in favor of one of the other two.

Discussion: Dr. Percival Bailey: It would be very interesting to know whether the excitability of a muscle decreases in fatigue states. It is generally accepted that the chronaxie of an excitable tissue varies only with the temperature, but I know of no observations in the fatigue state.

CURRENT LITERATURE

I. VEGETATIVE OR VISCERAL NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Miller, R. J., Bergeim, O., Reh fuss, M. E., Hawk, P. B. GASTRIC RESPONSE TO FOODS. [Am. Jour. of Physiology, May 1, 1920.]

A tardy recognition of well-known factors in gastric intestinal physiology. Sensory impressions alone of food was found by these authors to give rise to a distinct secretion of gastric juice in the average men. Odor alone, they think, produced less stimulation than sight. Tasting and chewing of food with closed eyes and plugged nostrils produced no marked secretion. The combined influences of tasting, chewing and smelling of food produced the greatest responses. Sound and image of a frying steak gave rise to gastric secretion. The influence of smell with hearing produced little additional effect. Disagreeable odors depressed secretion to the level of the continuous secretion. Foods unpleasantly prepared, or unpalatable in appearance, odor, taste and belief in their unwholesome character led to delayed acid response and evacuation.

Dazzi. THE ACTION OF ADRENALIN ON THE BLOOD. [Il Morgagni, April 30, 1921.]

This is an experimental study. The injection of 1 mg. of adrenalin is followed by an increase in the number of red corpuscles, granular bodies, and white corpuscles in circulation. As regards the red corpuscles this is slight and evanescent but is more marked and lasting for the other elements. The increase in white corpuscles is at first confined to the lymphocytes and afterwards to the polynuclear neutrophiles. He accounts for the lymphocytosis as a mechanical mobilization of the elements of the lymphatic apparatus of the spleen, due to the action of adrenalin on the smooth muscle fibers of the spleen. The numerical increase in the granular corpuscles and the polynucleated neutrophiles is due to the action of adrenalin on the unstriped muscle in the vessels, and in the medulla of the bones.

Schauman. FLUCTUATIONS IN PREVALENCE OF CHLOROSIS. [Finsk. Läk. Hand., November-December 1921, LXIII. No. 11-12.]

A clinical study which first comments on the marked diminution of the number of cases of chlorosis during the past 20 years in Norway, England, Sweden, Austria, and the United States. This experience con-

firms what has been observed in Finland. The high peak in the prevalence of chlorosis seemed to be between 1879 and 1903 in Sweden, and he compares this with the high peak of alcohol consumption in that country. He also goes into the field of the electromagnetic currents which may act upon the endocrine glands in some way. The virulence of certain bacteria has been shown to be modified in the magnetic field. The World War was instrumental in increasing the prevalence of tuberculosis and rachitis, but not of chlorosis. Swedish statistics show that chlorosis was very rare in that country before 1830. The high peak that followed then and again in 1891 points to the wave-like endemic appearance of the disease and the causes must be sought further than in the limits of the individual.

Arai, K. CHOLINE AS A HORMONE FOR INTESTINAL MOVEMENTS. VI. EXPERIMENTAL THERAPY OF GASTRO-INTESTINAL PARALYSIS FOLLOWING PERITONITIS AND LAPAROTOMY. [Arch. f. d. ges. Physiol., 1922, CXCI, 359.]

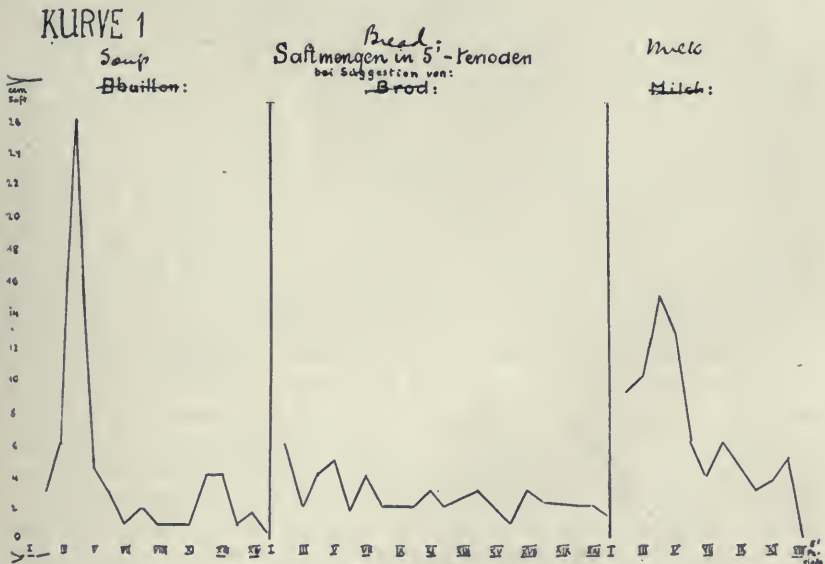
According to Magnus and his co-workers choline is the natural hormone for intestinal contractions, and a lowering of the choline production in the intestine, or a lowering of the sensitivity of the intestine to the substance, would result in a condition of stasis. In the present series of experiments, a serofibrinous peritonitis was provoked in rats by the intraperitoneal injection of an iodine preparation. Intestinal stasis followed, and was resolved again when 10 mgm. of choline hydrochloride per kilo body-weight was given intravenously. All the findings were controlled by X-ray investigations. Post-operative stasis was induced by performing laparotomy and manipulating the intestines; the results in general were similar to those in the peritonitis experiments. The choline content of the intestine in these experiments was found on analysis to be normal, as was also the response of the isolated intestine to the application of choline. In administering choline it is most important that the intravenous injection be made slowly. Choline borate ("enzytol") may be used, and was found to have a toxicity proportional to its content of choline base. [Medical Science.]

Heyer, G. R. PSYCHIC INFLUENCE UPON GASTRIC SECRETION IN MAN. [Archiv. für Verdauungskrankheiten, Vol. XXVII, Nos. 4, 5 and XXIX, Nos. 1, 2.]

Scientific interest turns in ever greater degree to those influences which psychically cause, advance, hinder, or otherwise influence the carrying out of physiological processes. Neither the normal chemico-physical processes nor the genesis and therapy of many diseases can be understood, according to my experience, without taking this factor into consideration. From studies of this sort on different organs and systems of organs this report takes up briefly the results of experiments

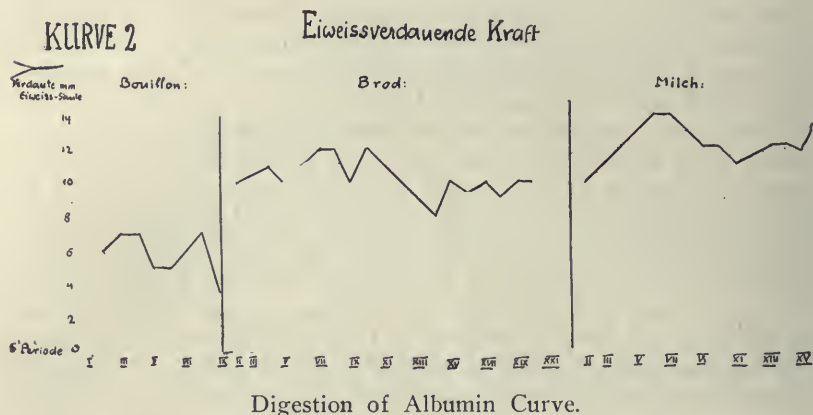
which have to do with the secretion of the stomach. Since Pawlow's fundamental communications the secretory activity of the stomach, as is well known, is seen to be divided into two parts. The first is brought about by an essentially psychic process. With the idea, wish, etc., in regard to the taking of food there follows an outpouring of the "psychic" juice. The second "chemical" flow follows this occasioned by the action of the freed digestive products. The validity of the facts discovered in dogs for the human stomach was not yet established but was much in doubt. The existence of this psychogenic influence has now shown itself capable of experimental proof.

The order of experiment was as follows: Gastrically sound individuals were hypnotized. Thus they were separated from the many changing influences of the external world and intensively subjected to the ideas desired by the investigator. A thin rubber bag (such as is used otherwise in investigation of the duodenum) was introduced gently into the left lateral portion in the fundum ventriculi of the subjects while they were in deep sleep. The always present content of the "empty" stomach was siphoned out. It appeared weakly acid, in large part digestive albumin, often 50 c.cm. or more. Then the enjoyment of a definite article of food was energetically suggested to the person under experiment. After a latent period of from 5-10 minutes an active out-flow of gastric juice began regularly, which lasted 15-60 minutes. It could be shown further that the type of secretion differed according to the kind of food suggested:



Gastric Contents after Suggestion in five-minute periods.

The absolute quantity vacillated without appreciable regularity. The appetite seemed to me to play the decisive rôle. By means of digestive experiments in a tube, according to Mett, the power of these three kinds of juice for digesting albumin were shown as also specifically enlisted for bouillon, bread or milk:



Colorimeter investigations of the acid conditions (according to Michaelis) gave the following: When the saliva flowed externally at a hypnotic command and reflux of the bile did not occur, a clear gastric juice was before us. The long prevailing opinion that this fluid in the same individual is poured out in always approximately equal concentration could be disputed; the sum of the acids is by no means always equally great but shows noteworthy vacillation. The curve for the bound acids does not run in inverse proportion to that of the free acids. Relations to the sort of nourishment suggested do not occur. The continued wetting, through the experiment, of the mucous membrane of the stomach with unappeased acids often caused strong secretion of mucus to arise. Where this was absent there was a tendency to minute hemorrhages. The normal flow of psychic fluid could be dammed, even checked by calling forth an affect, anxiety, fright, etc., to which the person experimented upon was subjected during work upon the stomach. Joyful stimulation of a sudden sort also had a diminishing effect, this never increased the secretion. If the disturbing suggestion was removed again at the right time the flow of juice began once more even without new suggestion. Different results were obtained with atropin, *i.e.*, emetin, according to *when* the injection took place. Injection before or directly after the suggestion used—that is before or quite soon after the beginning of the secretion—markedly reduced the amount and the acidity of the fluid, especially by otherwise hyperacidic patients. If the flow of juice was already appearing strongly the injection remained without effect. The blockade of the ends of the vagus could then no longer dam the

stimulus which had already reached the autonomic nervous system in the stomach wall. Analogous experiments with pilocarpin had to be quickly broken off on account of a strong tendency to hemorrhage. A diminution of the quantity of fluid was the chief thing established. Atropin works through paralysis of the nerves which promote secretion. By interference through affect must one think of an active production of paralysis (sympathicus)? The complexity of the conditions which are present, which warns one to proceed cautiously, showed itself clearly through the following experiment. When a larger enema of bouillon or warm water was given to the deeply hypnotized person in whom a special sensitiveness of the mucous membrane of the anus and of the sense of smell had been presumably removed by suggestion there followed almost at once an active outflow of the gastric juice, perhaps for five minutes.

Therapeutically and diatetically the facts which follow briefly reveal themselves from the experiments related.¹ The appetite is the cause of the secretion of the gastric juice, the more active the former, the more abundant the flow of the latter. The clear idea of the sort of food to be taken in effects the flow of the juice set free as fitting in its manner of outpour as in its acidity and pepsin content. Every diversion of the inner attention from the mealtime effects a disturbance of this. If it is a strong one it binds the secretory function to a complete standstill. Through the dependence of the action of the "chemical" upon the "psychic" juice the further action of the positive as of the negative influences upon the function of the stomach and intestine becomes clear. The administration of belladonna preparations in hyperacidity and hypersecretion (according to what has been stated these are not the same) is suitable. Only the patient should not first take his substance when the food already stands on the table but at the proper time, before appropriate ideas have already led to the outflow of the psychic fluid. On the other hand, the ceremonial observance of customs bound by usage to mealtime are of service for the latter, grace at table, music at dinner and the like, in the manner of the conditional reflex (Pawlow). Here chiefly the rousing and far reaching influence of chemicophysical processes by purely psychic occurrences are experimentally shown. Investigations upon the stomach and intestines, which will be published soon, show corresponding relations also for the motility of the digestive organs. [Author's abstract.]

Heyer, G. R. PSYCHIC GASTRIC SECRETION IN MAN. [Arch. f. Verdauungs-Krankheiten, 1921, XXVII, No. 4-5. J. A. M. A.]

(See preceding author's abstract.) Heyer shows the different fallacies and misleading conclusions that have been inevitable with the methods in vogue for testing the influence on gastric secretion of mental impres-

¹ See also: Therapie der Gegenwart, 1921, August number.

sions. It is impossible in man to make a Pawlow small second stomach for study of the "appetite gastric juice," but Heyer has devised a method which apparently answers the same purpose: The subject of the test receives only the desired psychic impressions and these in an intensive form, while all disturbing impressions (pain, dread, discomfort, etc.) are excluded, and the gastric secretion is obtained pure and in quantities. He accomplishes this by applying the test in hypnosis, and using a retention stomach tube with continuous aspiration. The hypnotized subject swallows the stomach tube without the slightest resistance; the end hangs out of his mouth and he lies quietly. Large amounts of gastric juice, sometimes highly acid and with great peptic power were found in most of the subjects when the stomach was supposedly empty, but there was no regularity in these findings. When no further secretion could be aspirated, after waiting five or ten minutes, the idea of a meal was impressed on the patient, the taste and the amounts suggested. He "ate" it with great relish, and this sham feeding lasted for two and a half minutes. In about five minutes, up to ten or fifteen, gastric juice then appeared, and was aspirated at five minute intervals, and examined for amount, acidity and digestive power. The findings were closely like those found by Pawlow with his dogs, the only difference being that with the dog the effect of the sham feeding lasted several hours, while in man it lasts only for an hour. But the curves for amount and digestive power, in corresponding five minutes for man and one hour periods for the dogs, are remarkably alike. The imaginary meal consisted of bouillon, bread, and milk, and the subjects were always in good health. The findings thus show that the human stomach secretes an "appetite gastric juice," and confirm anew the extreme importance of psychic impressions for the play of the vital phenomena. They confirm further that the suggestion to feed ulcer patients through a duodenal tube is dangerous; the gastric juice, not being neutralized by food in the stomach, and its ferment content not being used up, is sure to damage the mucous membrane. The findings teach that what Pawlow learned from dogs can be applied to man far more extensively than hitherto suspected. [See following abstract.]

Heyer. PSYCHIC INFLUENCE ON GASTRIC SECRETION. [Arch. f. Verd.-Krank., December 1921, XXIX, No. 1-2.]

Heyer's research during hypnosis, a fine stomach tube in place, with continuous aspiration, demonstrated a remarkable variability in the acid content of the gastric juice in the same person at different times after both test meals and suggestion. The suggestion of pain, danger, recalling of war happenings, arrested at once the gastric secretion in nearly all the subjects. The suggestion of agreeable events, a spring day, winning money in a lottery, etc., never had the opposite effect, but had the same arresting influence only it occurred more slowly. His research thus has demonstrated the law that any diversion of the mind, painful or

pleasurable, from the act of eating, checks the secretion of gastric juice. The effect is more pronounced, the stronger the mental impression. In one patient with pure mania the gastric secretion was found constantly normal. In all the subjects, the stomach secretion increased at once in large amounts when a nutrient enema was injected. The distention of the rectum evidently promoted secretion in the stomach by reflex action, as all psychic factors were excluded, and the reaction occurred too promptly for the nourishment to have made its influence felt. The findings in this line suggest the necessity for giving nutrient enemas a drop at a time, with gastric ulcer, to avert this reflex action from distention of the rectum. His tables show, for instance, a drop from 10 or 20 or 18 to 0.5, 2 and 1 in the amount of gastric juice secreted under the suggestion of bombing, a railroad action or the like. The drop was from 10 to 3 under suggestion of good news. Atropin given before or with the sham feeding checked secretion, but it did not seem to influence it when not administered until the secretion was well under way. Heyer's first report on his research in this line was described in *THE JOURNAL*, June 11, 1921, p. 1714. [See preceding abstract.]

Fischbein. ACHYLIA GASTRICA. [Boston Med. and Surg. Jour., March 30, 1922, CLXXXVIII, No. 13.]

In this study of 30 cases of primary *achylia* the author invariably found gastric hypermotility. After considerable straining and retching on the part of the patient, not more than 10 to 15 c.c. of gastric contents could be obtained, consisting of a thick, practically neutral liquid with an admixture of mucus from the throat, in which were suspended a few poorly digested crumbs of bread used in the test meal. Achylia is not only a disturbance in secretion, but a disturbance in motility as well. Primary achylia, in the sense in which the essayist uses the term, is found almost exclusively in neurotics. It occurs more often in men than in women, and is more common in young adults and in the middle-aged than in the elderly. Neither is achylia due to primary cell atrophy in consequence of some local infection, as maintained by Bassler, as his observations were made upon pieces of gastric mucous membrane obtained in vivo, which are not indication of any pathological changes in the stomach. Besides, primary cell atrophy, even if it does exist, need not involve all the secreting cells, and thus give rise to achylia. Achylia is, like hyperacidity and hypersecretion, either a symptom or a part and parcel of a general neurosis. Practically all the patients in this series were pronounced neurotics, the majority of them being in the prime of life and in good physical condition, with no history of antecedent infection, intoxication or other illness, to which their gastric disturbances could be attributed. In some the local as well as the general symptoms disappeared under treatment; in others, the local symptoms disappeared, while the general symptoms persisted. Some, after getting rid of their digestive disturbances, complained of headache, dizziness, or a feeling

of faintness, so that there could be no doubt as to the nervous nature of the affection. Further, experiments have shown that emotional states are followed by actual physiological and chemical changes; but why these changes should, in some cases, give rise to a hypersecretion or hyperacidity, and in others to anachlorhydria or achylia, is not known and can only be surmised in analogy with nervous disturbances elsewhere. [Psychoanalysis tells the reasons.] The treatment of achylia is general, dietetic and medicinal. The general treatment comprises a variety of methods, of which psychotherapy is the most important. A mixed diet is employed from which those foods alone are excluded which, by their chemical or mechanical action, might cause irritation and distention of the stomach. Dilute hydrochloric acid, which has been highly recommended by almost all authorities as the drug *par excellence* in achylia, has been found, in the writer's experience, to be not only of no benefit whatever, but, in some cases, even to aggravate the dyspeptic symptoms; neither has he seen any benefit from *nux vomica*, tr. *cinchonæ comp.*, and the other so-called stomachics. On the other hand, drugs like the bromides, chloral hydrate, extract of valerian, and tr. *opii*, have been found of decided benefit.

van Paassen, P. CALCIUM FACTORS IN SPASMOPHILIA. [Nederlandsch Tijdschrift v. Geneeskunde, August 1921, II, No. 8.]

This author's study shows again how premature many hard and fast conclusions in the chemical field may be. He finds that one must pay attention more to the free calcium ions rather than to the total amount of calcium in the tetany reaction.

Brüning, F., und Gohrbandt, E. AN EXPERIMENTAL CONTRIBUTION ON THE PATHOGENESIS OF PAIN IN INTESTINAL COLIC. [Berl. klin. Wchnschr., 1921, LVIII, 1431.]

The authors preface their observations with a quotation from an earlier paper by one of them (Brüning) to the effect that, whereas previous students of the problem of gut sensibility claim to have employed adequate stimuli in their work, yet in fact they have not done so, since the serous coat alone has been stimulated. The adequate stimulus must reach the mucous surface, that is, the stimulating object must be within the lumen of the gut. However, they are mistaken in supposing that this physiological point is unknown, as a perusal of the literature of other countries would have taught them. The term "adequate stimulus" has been employed by Sherrington in discussing this particular problem. Therefore, although, as they remark, no satisfactory conclusions as to the sensory endowment of the gut have ever been reached, yet in this country, at least, the essential elements of the problem have long ago been recognized by Head, Sherrington, and others. Nevertheless, the observations recorded in this paper are of considerable interest as a contribution to our knowledge of the problem. The authors employed dogs, cats,

and rabbits for their experiments, and, to avoid the complicating effects of local anesthesia of the body-wall at the time of making observations, they had recourse to a modification of the procedure devised by Kappis. In a preliminary operation a triangular area of the abdominal wall below the umbilicus is rendered anesthetic by section of its nerves through two incisions which start from the umbilicus and run downwards and outwards toward the superior iliac spines. Later, the body-wall is opened without an anesthetic and the gut exposed.

A coil of small intestine is exposed and the mucosa stimulated, either by injecting into its lumen through a fine cannula from 5 to 10 c.cm. of an irritating solution (hydrochloric acid, ether, alcohol, turpentine oil, or barium chloride solution), or by making a free incision into the gut opposite the mesenteric attachment and pouring the solution on the exposed mucosa. In this way a large area of mucosa is stimulated and the presence or absence of pain is determined by watching the animal's reaction. They find that the animal shows signs of feeling pain only when the gut goes into contraction. As soon as muscular spasm develops, and until it dies away, there is clear evidence of pain, and unless this motor reflex response occurs there is never pain. They conclude that this pain arises in the gut-wall itself, and is not a result of any pulling on the mesentery resulting from the local gut movement. Such movement is not constant, and when it occurs it is minimal and not comparable with the movement which must be of constant occurrence under normal conditions.

Further, if the mesentery be rendered insensitive by application of cocaine, the pain still develops as soon as the gut-wall goes into spasm. It has been stated by earlier observers that the application of irritative chemical substances to tissues endowed with sensibility produces a localized hyperemia ("primäre Reizhyperämie"). This hyperemia is constant in the mucosa of the gut, while, as Breslauer-Schück described, the visceral peritoneum, unlike the parietal peritoneum, does not react in this way. Therefore, the mucosa of the gut, and not the serous coat, is supplied with sensory nerves. They explain the apparent insensibility of the gut to surgical procedures as due to the inadequate and transient character of the stimuli applied and to the fact that the localization of the pain is not recognized by the subject. Therefore they conclude that stimuli applied to the gut-wall elicits pain only when powerful contraction of the musculature of the gut occurs. The pain elicited is in the gut itself, which possesses sensibility. [Medical Science.]

Wilson, J. T. THE DOUBLE INNERVATION OF STRIATED MUSCLE. [Brain, 1921, XLIV, No. 234.]

In this paper Wilson summarizes the various morphological studies on the innervation of striated muscle. He discusses the subject under two headings, plurisegmental innervation, and innervation through the "accessory system" of motor fibers, alleged to be of sympathetic origin.

Plurisegmental innervation. Single muscle-fibers are commonly supplied by motor fibers from more than one segmental nerve. The muscle-fibers themselves may be plurisegmental in origin. In the case of adjoining body segments, the mesoblastic syncytium of the embryo forms a continuum connecting adjacent myotomes across intervening myosepta. Myofibrillar differentiation then occurs, so that each of the resulting muscle-fibers is polymeric. Agduhr has made some experimental observations on the force of contraction obtained from separate and conjoint stimulation of two segmental sources of nerve supply to a single muscle, and he concluded that there is an overlapping of the innervation region of separate nerves within the muscle. He also found that the region of the muscle, thus doubly innervated by adjacent segmental nerves, is greater than that doubly innervated by the peripheral nerves. This appears to indicate that a large number of individual muscle-fibers possess a double segmental innervation. Of the several end-plates which a single muscle-fiber may possess each belongs to a different segmental nerve. On the other hand, the observations of Floresco and Cavalié indicate that a single motor nerve may give off fibers to several end-plates in a muscle-fiber.

The accessory system. A second type of motor innervation of striated muscle has also been described, consisting of nonmyelinated fibers which may pass to the ordinary motor end-plates which we have considered, but more commonly end independently. It has been suggested that these fibers are sympathetic in origin. It is certainly clear that they are distinct in origin from the general motor nerve supply of the muscle. Wilson points out that the conception of an accessory, sympathetic source of motor nerve supply to striated muscle is not novel, and briefly reviews the literature on the subject between the years 1882 and 1909. Recent advances in histological technique have opened up fresh possibilities in the study of these nerve endings, and it is to the work of Boeke that we chiefly owe our new conceptions on the subject, for it has definitely established the dual innervation of muscle-fiber. Working on the development of motor nerve endings in invertebrates, he recognized a system of fine nonmyelinated fibers, independent of the ordinary myelinated fibers, and ending in characteristic end-organs, in the form of fine loops or networks embedded in the sarcoplasm of the ordinary end-plates, and also in distinct end-plates by themselves. He was impressed by their hypolemmal position in the muscle and concluded that they must be sympathetic in origin. With regard to the function of this system, Boeke refers to the work of Pekelharing and van Hoogenhuyze, Mosso and de Boer. The last-named claims to have proved, in the case of the frog, that the tonic innervation of muscle is carried out through these fibers and by the sympathetic system. Dusser de Barenne was not able fully to confirm this observation, and Kuno definitely failed to do so, and the thesis remains unproven. However, morphological evidence is in favor of the sympathetic origin of the nonmyelinated fibers in

question. Wilson points out that most of Boeke's observations, in which he has attempted to differentiate the two groups of nonmyelinated fibers by taking advantage of their different degeneration times, are open to the objection that his clearest demonstration of nonmedullated fibers was obtained from material in which most of these fibers had been severed from their trophic centers and were already degenerating. Now a very thin myelin sheath, under these conditions, would have already suffered and might escape detection. The evidence that there are two separate systems of nonmyelinated fibers supplying the eye-muscles Wilson considers open to grave objection, and in their later paper Dusser de Barenne and Boeke appear to have abandoned the contention. In conclusion, Wilson finds that the nonmyelinated fibers are sympathetic in origin and hypolemmal in termination. Their relationships would appear to indicate that they conduct centrifugally, presumably motor impulses, which may possibly be of tonic contractile character. [Medical Science.]

Adrian, E. D., and Owen, R. D. THE ELECTRIC RESPONSE OF DENERVATED MUSCLE. [J. Physiol., 1921, LV, 326.]

Henriques and Lindhard in a recent paper have argued that the electric change which occurs in a muscle on stimulation is due to a change of potential in the motor end-plate, there being no propagated electric change in the muscle-fiber itself. According to these authors, contraction of the frog's gastrocnemius in response to direct stimulation gives rise to no electric variation. Adrian and Owen have tested this hypothesis on the frog's sartorius. The sciatic nerve was cut high in the thigh and the animal subsequently pithed at varying intervals in different observations. The sartorius was stimulated at the pelvic end before and after destroying the tibial end with a hot wire. The electric response was led off by electrodes on the tibial end. After each experiment the muscles were treated with methylene blue. When an interval of thirty-six days had intervened between section of the nerve and the final experiment no trace of nerve-endings could be found in the muscle; nevertheless, in every instance, there was an electric response of diphasic character as in normal muscle. They conclude, therefore, that the nerve-endings contribute nothing to the electric response, and that the absence of response described by Henriques and Lindhard occurs only when the leads are taken from inactive muscle. [Medical Science.]

Hannes, B. INSUFFICIENCY OF ILEOCECAL VALVE. [Münch. med. Woch., June 25, 1920. J. A. M. A.]

This is an experimental study of the potency of the ileocecal valve in cats and dogs. He has found that the ileocecal valve is open in animals when the stomach is empty, and closed after they have been eating. In one experiment psychic motility was sufficient to close promptly the valve that had been open during a state of fasting; for in the dog that had fasted two days 200 c.c. of tap-water (37 C.) injected rectally were

ejected at once from an ileac fistula, but, after 200 c.c. of bouillon had been ingested by mouth, which in a few minutes was ejected from a duodenal fistula, and then 200 c.c. of water were injected rectally a second time, no fluid came out of the ileac fistula. The closure of the ileocecal valve, he believes, is not due merely to the mechanical filling of the small intestine but rather to the psychic motility aroused by eating. A definite analogy is thus established between the pylorus, which prevents the bile from entering the stomach from the small intestine, and the ileocecal valve, which prevents the contents of the large intestine reëntering the small intestine. So far as the X-ray technic is concerned this psychogenic factor must be recognized and if possible reckoned with.

Talentoni. HYPERCHLORHYDRIA AND VAGOTONIA. [Rev. Crit. di Clin. Méd., November 25, 1920, XXI, 33.]

A series of clinical observations in which the author gives the details of five cases of hyperchlorhydria, including some with gastrosuccorrhea. Cardiac vagotonic syndromy was present in all. In a sixth case there was pronounced hyperchlorhydria but no vagotonia. In another case there was vagotonia but hyperchlorhydria was absent. The vagotonia may affect the lungs alone with asthma; or the heart, or the stomach, causing hyperchlorhydria, but all these effects might result from hormones. All these three pathologic conditions have intervals of quiet, and treatment should aim to hasten these intervals of repose. On this hypothetical basis he gives a mixture of the three tinctures derived from the *Solanaceae*.

Hatai, S., and Hammett, F. S. FOUR FACTORS CAUSING CHANGES IN THE TYPE OF RESPONSE OF THE ISOLATED INTESTINAL SEGMENT OF THE ALBINO RAT (*MUS NORVEGICUS ALBINUS*) TO SODIUM CARBONATE. [Am. J. Physiol., Baltimore, 1920, LIII, 312-322.]

When an isolated duodenal segment from an albino rat is suspended in oxygenated Tyrode's solution at body temperature and is stimulated by the addition of small amounts of sodium carbonate, the usual response is a contraction or shortening of the segment. There are segments, however, which instead of responding by a contraction, relax on the application of the reagent. It was determined that one of the causes of this reversal of reaction lies in the previous excitation of the experimental animal; for when rats are frightened or angered previous to the removal of the segment for testing, then the subsequent stimulation by sodium carbonate results in a relaxation instead of the usual normal contraction obtained from the quiet animals. It would appear from this finding as if a condition of excitability has the effect of producing an abnormal functioning of the intestinal neuromuscular mechanism, which may serve in part to explain the gastropathies found in the psychiatric clinics. Other experiments reported in the paper demonstrate that the reversal is mediated by means of the splanchnic fibers, since when these

are electrically stimulated in the intact animal prior to the removal of the segment for testing, the response to the carbonate is again a relaxation. A third factor causing changes in the response was found to be concerned with the condition of the nervous system at the time of heat or menstruation, for in animals taken for experiment during this period, the reversal of the response to the carbonate stimulation was obtained. The fourth factor was age, older animals being less susceptible. [Author's abstract.]

Klippel and Weil, M. P. GASTRIC ULCER SIMULATING THE CRISES OF TABES. [Arch. des Mal. d. l'Appareil Dig., August 1921, XI, No. 4.]

Hematemesis with tabes generally occurs during a gastric crisis and after vomiting, while the hematemesis with gastric ulcer or cancer may occur at any time, and the blood is bright red. Gastric ulcer may be accompanied by polyneuritis, the pains resembling those with tabes; they have had three cases of this kind, with necropsy in one. Tabetic hematemesis is rare. Only about 6 cases are on record in French neurological literature.

Finney and Friedenwald. PYLOROSPASM IN ADULTS. [Amer. Jour. Med. Sciences, October 1921.]

The medical and surgical treatment of pylorospasm in adults is here taken up. The largest number of cases, they believe, are secondary to some irritative lesion in the stomach, or as a reflex from disease elsewhere—for instance, chronic appendicitis, nephritic colic, gall stones, etc., but a few are purely psychogenic without gross lesion. Symptomatically hunger pains, relieved by emptying the stomach or by taking food, occur two or three hours after meals with palpable stomach contractions, and signs of intermittent stagnation and hyperacidity. It is important to determine whether the lesion producing the spasm is within the stomach or beyond, or whether the condition is purely nervous, and in this connection X-rays are most valuable in differentiating between the types. Medical measures should always be carefully tried before resorting to other methods of treatment, and the underlying neurasthenia should be overcome by change of scene, massage, and rest. Easily digested food at regular intervals should be given, and the administration of olive oil is of service, the attacks being relieved by morphine and atrophine hypodermically, hot applications, and lavage. Atrophine in full doses, or adrenaline nucleoprotein, are valuable in relief of spasm, but if this is secondary to other abdominal lesions the primary cause should be removed first. The authors conclude that when medical measures fail pyloroplasty gives the most satisfactory results.

BOOK REVIEWS

Snell, O. BERICHT ÜBER DIE PSYCHIATRISCHE LITERATUR IM JAHR 1920. [Walter de Gruyter & Co., Leipzig.]

We are glad to welcome this Bericht which has not come to the reviewer's desk now for some years. The Allgemeine Zeitschrift is the oldest psychiatric publication of Germany and for a number of years Dr. Snell has issued this bibliography and résumé as a literature summary to the Zeitschrift. It is an invaluable reference publication for the worker in psychiatry.

Lewis, Nolan D. C. THE CONSTITUTIONAL FACTORS IN DEMENTIA PRECOX. [Nervous and Mental Disease Pub. Co., Washington and New York. \$3.00.]

For a number of years there has been progressing in St. Elizabeths Hospital at Washington a concerted series of researches upon the problems of psychiatry. No single institution nor laboratory in the United States has produced so much from its material in the way of articles, monographs, magazines, books, technical and popular lectures. It has been a live source of psychiatric propaganda of the most vital and valuable quality. Viewed partly from the side lines, here at least is a governmental activity of preëminent value.

The present monograph is but one of the many contributions which have issued from this hospital of intensive work. In it Dr. Lewis has sought to present certain outstanding features which should interest every physician who has any scientific curiosity.

All the diseases of human beings have been defined as "reactions of the human organisms to environmental factors." What man may have brought with him—*i.e.*, his heredity or "constitution" is recognized—at times overemphasized. Stress, toxins, infections, emotional conflicts, as partial statements of "environment" are also recognized—at times, still more overemphasized. Rarely, but still not negligible, may be recognized those workers in medicine who have attempted a tangible correlation between these two sets of factors and have given the profession studies of fundamental importance.

In the field of psychiatry—*i.e.*, in that domain in which the most complex of all types of reaction are taking place, the difficulties for comprehensive correlations are almost insurmountable. To comprehend even the simplest types of behavioristic deviations requires more background than to understand the most complex of somatic lesions. Pneumonias, typhoid fever, cirrhosis of the liver, are in a sense child's play in interpretation when compared to hysteria, manic-depressive psychosis, or dementia precox. Any review of the work

in internal medicine at the present time will reveal at once that we are a long way from mastering the a, b, c's of the comparatively simple somatic disturbances. Hence it is with a definite sense of accomplishment that we review this effort at setting forth the subtle backgrounds revealed in this most complex of so-called mental disturbance, dementia precox.

By many workers in neuropsychiatry Southard's genius was recognized and it is with a definite sense of gratitude to his memory that we find that Lewis has so well summarized what the chief trends of Southard's work had revealed. Apart from the necessary defects in Southard's autopsy material he seemed to have gone past these and found a few universals which could be built upon. Lewis, with less personal material but more exhaustively analyzed, with a large background of careful autopsy work at St. Elizabeths (Blackburn and others), and with a wider acquaintance with actual general pathological data and of the psychological mechanisms, has pushed the foundations up to a higher level of description and of interpretation.

In this monograph he has analyzed this material in a comprehensive way and for the first time has presented a somatic picture of dementia precox unequaled in the literature of psychiatry.

Cobern, Camden M. THE NEW ARCHEOLOGICAL DISCOVERIES AND THEIR BEARING UPON THE NEW TESTAMENT. [Funk and Wagnalls Company, New York and London.]

This is a sixth edition of a popular work which seeks to illuminate the background of history especially in its relations to those fundamental emotional reactions of human beings to what is broadly termed "religion." A somewhat modern philosopher has stated that fortunately human learning was swinging away from dogmatic intellectualisms to a more fundamental philosophic understanding of human "feelings." Only through such a movement could be understood the hold that religion had upon the masses. Christianity was a working formula. Any study of its sources was desirable. This is what this work does—and does it in an interesting manner.

The worker in psychiatry who is in constant contact with the expression of religiously colored feeling can read this account with profit.

Cathcart, E. P., Noël Paton, D., Pembrey, M. D. PRACTICAL PHYSIOLOGY. [Longmans, Green and Co., New York. \$6.00.]

The trend in the modern tide of medicine is towards physiology. The anatomical, structural foundations in medicine have been overdone. The wheels, and cogs, and transmission machinery have been analyzed too intensively separated from their functions.

This short practical manual gives a comprehensive series of experimental procedures aimed at the elucidation of functional capacity. It is well done and although a book for the medical student in the strict sense, and for whom invaluable, it can be read by the practitioner to advantage.

Heymans, G. UEBER DIE ANWENDBARKEIT DES ENERGIEBEGRIFFES IN DER PSYCHOLOGIE. [Johann Ambrosius Barth, Leipzig.]

Mechanism, Dualism, Psychical Monism, these have represented three cardinal philosophical aspects through which, with their numerous intermediate forms, mankind has attempted to understand himself and his doings in the world. Many aching heads and oftentimes broken bones have been the accompaniments in this effort at comprehension.

The present small brochure from the professor of philosophy at Gröningen speaks for the value of the standpoint of psychical monism. Psychical energy is the whole show. How he essays to prove it must be left to the labors of the reader who will at least have an interesting time with this clear statement of the situation.

Cornell University Studies in Neurology. Vol. XI.

This interesting collection of reprints preserves in a single volume the many papers from Dr. C. L. Dana's clinic. There are 25 of them. They are contributed by Doctors Dana, Kennedy, Oberndorf, Kraus, Ingham, Pardee, and Davis.

Krische, Paul. MARX UND FREUD. [A. Hoffmann's Verlag, Berlin.]

This brochure consists of two short essays in which are expressed general ideas concerning the light thrown upon social problems by means of the newer hypothesis concerning the human instinctive activities and the unconscious.

A host of papers along similar lines are available. Those here presented offer some general reflections of interest and of value.

Lewandowsky, M., Bumke, O., v. Förster, O. HANDBUCH DER NEUROLOGIE. [Ergänzungsband. Erster Teil: Julius Springer, Berlin.]

It was a happy idea to continue the Lewandowsky Handbuch. The five volumes of this classic have been of inestimable service in the formulations of present day neurology, and now after the long pause in publications of serious moment, this new volume is welcome. Most of the chapters deal with "war" experiences. Birnbaum of Berlin contributes the first chapter on Psychopathy and Psychoses; Bumke of Leipzig on General Features of the War Neuroses. Kehrner of Breslau writes on Special Symptomatology of Hysteria and Neurasthenia; Lange of Breslau on Treatment of War Neuroses, and Redlich of Vienna discusses Epilepsy. The combined contributions, with index, make a volume of 500 large octavo pages.

In spite of the fact that the medical world is more or less "fed up" on war material, nevertheless these contributions, although of slightly uneven value, are worth while. Birnbaum has emphasized his purpose in picking out what was "striking, important and typical" from the mass of psychopathies and psychoses which came under observation. The war was a vast psychopathological experiment. He views it consistently and wisely from this angle. The

specific noxæ considered are (1) physical exhaustion factors; (2) emotional factors, (3) mechanical trauma, (4) infections, (5) toxic. Specific diseases are taken up briefly, special emphasis is laid upon the various psychopathies. Bumke's contribution is short, focusses chiefly about Oppenheim's views, partially shows their rigidity, but contributes nothing radically new. He admits the inadequacy of the older concepts, but does not permit himself to discuss the newer ones.

Kehrer catalogs with much care the enormous symptomatology of the war hysterias and neurasthenias. It is a valuable chapter of descriptions, but is sterile in meanings. Hypnosis, suggestion, psychoanalysis (à la Frank), Kaufmann suggestions with electrical appliances, exercises, occupation, are the chief methods of treatment discussed by Lange—who also considers the actual war situations, What to do at the front, at receiving stations, at sanatoria, etc., etc. After-treatment and compensation are also discussed by him.

The final chapter on Epilepsy by Redlich is a masterly digest of a great amount of work.

On the whole the work is quite one-sided. It is strictly limited to the German workers. Practically no names appear in the bibliographies but those of Germany. As a limited contribution it is excellent. Older points of view are chiefly recorded and utilized. It is extremely static in its general attitude towards most of the problems discussed.

Prinzhorn, Hans. BILDNEREI DER GEISTESKRANKEN. [Julius Springer, Berlin.]

This is a sumptuous volume of 260 large octavo pages, with 187 figures, many of which are in color, illustrating many phases of artistic production by psychotic individuals.

The author calls it in his subtitle a contribution of psychology and to the psychopathology of form perception.

The so-called "Gestaltungs" psychology is one of the newer psychological developments of German origin. Kaffka has founded a new journal devoted to the development of the principles underlying it, and the present author has made this psychological trend the main scheme of his point of attack upon the psychopathology of form perception.

In his opening sentence the author rejects, and wisely, the older titles such as the "Art of the Insane," "Pathological Art," "Art and Insanity." Such titles get no one anywhere; they lead by means of prejudicial channels to sterile nothingness. Art is just as difficult to define as "mental disease," and to link them is as sensible as to talk of "curly haired waiters," or "freckled seamstresses," as entities from which one could generalize. Prinzhorn attacks the central problem of why individuals attempt to express themselves through certain channels.

To shape, to figure, to form, to fashion—these are some dictionary synonyms of the word "Gestalt." The activities along these lines through which certain individuals with different psychotic reactions have endeavored to express themselves are here set forth.

Neutra, Wilhelm. MORPHINISMUS UND EROTISMUS. [Franz Deuticke, Wien, 1923.]

In a previous issue of the JOURNAL we have had occasion to review Neutra's contribution to hysteria. In this review we have expressed our real interest in this author's general viewpoint and have tried to show wherein he has failed to show a fundamental acquaintance with the larger aspects of the hysteria problem, in spite of his sincerity and insight into the intricacies of the general situation.

The present discussion reveals the same general difficulties. Morphinism, as an accidental or as a fundamental regression, offers much material for an intrinsic understanding of unconscious processes. In a sense the author has grasped this opportunity; he has sensed the phenomena, but, has he made himself the master of it? We do not think so.

Upon what foundations is this judgment granted? In the first place his pharmacological psychological data are insufficient. Neurologically expressed, he is not acquainted with what morphine really does to the nervous mechanisms. Psychologically appraised a similar lack of appreciation is apparent. Neutra's resistances to the Freudian psychology blocks his appreciation of the regressive factors laid bare by the study of the "Unconscious." If he had psychoanalytically studied a single case of intrinsic morphinismus he would have been able to appreciate the underlying erotic factors involved.

His 194 pages, albeit a conscientious effort at the understanding of the problem, would have given prognostic fruit if he had not blinded himself to obvious psychoanalytic findings.

Richardson, C. A. THE SUPREMACY OF SPIRIT. [Moffat, Yard and Company, New York.]

The author is a professional philosopher. He has written a larger technical presentation of what he terms "Spiritual Pluralism." This work is an abridged popular résumé of his general hypothesis.

As far back as historical records take us it is evident that all human beings have attempted constructions of the "Universe." Imperative curiosity has operated to make "explanations" of the why of things. The author rapidly reviews the advance(?) from primitive savage to moderns in this "Ceaseless Quest." The rise of "modern philosophy" out of this primeval ooze is then entertainingly and reasonably told. "Space-time, immortality and freedom" are the three great problems which have come to occupy the focus of the modern. Their setting is likewise well outlined in the author's third chapter. This leads to the duality of "body and mind." The general hypotheses are broadly sketched. The author holds that "mental activity may well continue after bodily death." "Whose"—he does not tell us!

Chapter V deals with the notions of "Conscious, Subconscious and Unconscious." Here the author leaves "biology" and enters "projected subjectivism." This carries him into "Psychical

Research." He accepts the "substratum of facts." His lack of knowledge of psychiatry now becomes evident and we are finally landed into the harmless delusions of the sane: namely, the factual existence of "individual spirits." The psychiatrist does not deny their possibility; he only demands that the phenomena of well recognized "projections" be better correlated than the "philosopher" has as yet accomplished. He requests of such writers that they know more about "autistic" thinking before their "explanations" will hold water. [Jelliffe.]

Laughlin, Harry Hamilton. EUGENICAL STERILIZATION IN THE UNITED STATES. [Psychopathic Laboratory of the Municipal Court of Chicago.]

EUGENICS has become a modern Shibboleth. "*Keep the Life Stream Pure*" is its slogan. Sentimentality has been the besetting delusion of the "Round Heads." We are told that it sprang from ancient Asiatic sources. Intellectualism, Absolutism, Bureaucracy, Prussianism, "Sterilize the Unfit," are its modern symbolizations. Orthodoxy is my doxy, heterodoxy, the other fellow's, is its underlying unconscious motivation. Egotism, the "Jehovah Complex"—its fundamental springs of action; made in the "Image of God" its sacrosanct justification. "Roman Law" its mechanism; "Normal" its scientific(?) propaganda; "Business" and "collect the coin" its practical outcome. It is of little moment, in fact the thesis is anathema, that Sodom and Gomorrah are its models, that self-preservation is the main object of life.

Here are 500 pages devoted to the exposition that the ancient myth of Uranus, who was castrated by his children, can be made a practical formula for race betterment.

With commendable diligence the author has collated the laws of various states in the Union apropos of this chimerical delusion that legal enactment can regulate the laws of the universe. It is a sorry spectacle which shows us how the *morons* of the world would attempt to make others in their image.

It was Herbert Spencer who stated there were too many legal devices in the world. The present volume demonstrates the insane paranoia of legislative enactment which would essay to regulate the essence of creative evolution. The homosexual component of mankind, with its sadistic hatred of the female principle in evolution, crops up at critical periods of the world's history. The World War was one of its inevitable consequences; legislative "castration" one of its minor but characteristic symptoms.

OBITUARY

DR. IWAN BLOCH

Dr. Iwan Bloch, the dermatologist and sexologist, has died at the age of fifty. Besides various contributions to dermatology and the etiology of sexual diseases, Bloch has written a number of works on the history of medicine which are valuable for the history of civilization. Worthy of special mention is his "History of Prostitution." Under the pseudonym Eugen Dühren, he published a monograph on the Marquis de Sade, which is an instructive contribution to the history of sexual perversions and to the history of morals in the eighteenth century and the period of the Revolution in France. He took an active part in the founding of the Berlin Aertzliche Gesellschaft für Sexualwissenschaft. The London society for research in sexual science made him an honorary member, two years ago, which was the first honor of this nature accorded since the war to a German scientist. He was also a member of the Gesellschaft für Bibliophilen, and secured the publication of an unprinted letter of Kant and the posthumous works of Heinrich Lautensack. Several months ago Dr. Bloch contracted a severe influenza infection, which was the beginning of a long illness, during the course of which he had to undergo the amputation of first one leg and then the other.

HERBERT JAMES HALL, M.D.

Dr. Herbert James Hall died at his home in Marblehead, Mass., February 19, 1923. He was born in Manchester, N. H., in 1870, graduated from the Harvard Medical School in 1895 and served as intern at the Children's Hospital of Boston and the Massachusetts General Hospital. He had a large general practice in Marblehead from 1896 to 1912. While engaged in this practice he became interested in the problem presented by patients who were handicapped in one way or another in the struggle of life. He was convinced that by adjusting the task to the worker and the worker to the task that much profit might accrue to the world from lives that would otherwise be wasted. He particularly saw that while there were many men and women of weak physique or nervous temperament, yet possessed of fine intellect, artistic taste or manual skill, that their ability was going to waste because no one was fitting their tasks to them. Unable to take full part in industry or the world's work no attempt was made to salvage what they could do.

In the midst of his busy practice, Dr. Hall gathered a group of such patients about him, started a pottery, a blacksmith shop, a carpenter shop, a weaving room and other industries and set them to work. He met with so much success in the handling of these patients and his interest so centered in this work that in 1912 he gave up his general practice and opened the Devereux Mansion Sanatorium at Marblehead. Here with facilities for forty patients, his large medical workshops, the beautiful view of Massachusetts Bay across the lowlands and the beach, he had the surroundings that he loved and ideal conditions for his patients.

Dr. Hall's personality was an unusual one. His intelligence was strong and active. He was sympathetic and devoted to his patients. There are many men and women to whom he gave a new courage to face the world and who learned from him methods of occupation and of thought which made their lives worth while to them. Dr. Hall's love of nature was a passion with him. His two books of poems, "Moonrise" and "The Sea World Waits," demonstrate this to all who read them. Music, architecture and all beautiful things made strong appeal to him. In the later years of his life an increasing deafness afflicted him. This made it more and more difficult to converse with others. His compensation was an increased love for and appreciation of nature.

Dr. Hall's prose works were, "The Untroubled Mind," "War Time Nerves," "Handicraft for the Handicapped" and "The Work of Our Hands." Sound philosophy and helpfulness marked his writings. Dr. Hall's last illness was many months in length. He suffered bitter pain and anguish. The following is his poem:

TRIUMPH

All, all is taken from me, all—
I know but heavy sorrow and the long
Insistent pain that comes of hopeless wrong.
The heavens that were love and beauty fall—
Joy and laughter are beyond recall,
Yet shall the barren places hear my song,
Yet shall the courage of my faith be strong,
Unmoved, resistant like a great sea wall.
For in the barrenness of life I feel
A dignity and greatness that can be
Naught but the hand of God. Cold and bare
The sloping shores, merciless as steel
The hard flat surface of the circling sea—
The more life mocks at me the more I dare.

—*Bost. Med. & Surg. J.*

NOTES AND NEWS

SCHOLARSHIPS IN NEUROLOGIC RESEARCH

The *Informatteur* of Paris relates that the Laan Endowment, the seat of which is at Amsterdam, offers a scholarship of 250 florins a month to a research worker of either sex of any country, studying the nervous system along the lines specified by the R. A. Laan Endowment or suggested by the Netherlands Neurologic Society. Prof. C. Winkler of Utrecht is president of the endowment, and Dr. C. C. Delprat is secretary. The latter's address is Jan Luykenstraat 98, Amsterdam. The stipend is to be continued not longer than six months or nine months to the same person. The committee passing on the applications includes the director of the central institute for the study of the brain at Amsterdam and one of the members of the committee for control of this institute appointed by the Netherlands Academy of Sciences.

THE SWEDISH INSTITUTE OF EUGENIC BIOLOGY

The *Informatteur* relates that the government has appropriated 60,000 crowns toward the expenses of Dr. H. Lundborg's institute for biologic research on heredity and racial characteristics. Dr. Halkrantz has been appointed professor of research on heredity, and Dr. Nillsson-Ehle, professor of statistics. An experimental section for biopathology is planned, and a museum for the collection of data on hereditary factors. The settled character of the population in Sweden, generation after generation, affords unusual facilities for such research. Lundborg and his staff have published a number of studies along these lines, which have appeared mostly in the publications of the Swedish Medical Association. Lundborg is professor of psychiatry and neurology at the University of Upsala.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

The Journal

OF

Nervous and Mental Disease

An American Journal of Neuropsychiatry, Founded in 1874

ORIGINAL ARTICLES

TWO CASES OF MAJOR TIC

By MARTIN W. PECK, M.D.

BOSTON, MASS.

The patients to be described were studied at the Boston Psychopathic Hospital for a period of months during the fall and early winter of 1921. The presenting feature in each case was a compulsive stereotyped motor exercise, which bore strong evidence of having absorbed the sensual and emotional values which normally belong to the sexual field.

The histories revealed poor management of the sexual instincts with long continued autoerotism and general lack of restraint. In both cases there was present some reduction of affect with indifference to symptoms and situation; and a lowering of the usual esthetic standards. No delusions, hallucinations or disorder of the intellectual functions were present. The behavior and general reactions were not sufficiently unusual or striking to have made hospital care necessary except on account of the tics.

The possibility of an organic basis for these syndromes could not be wholly excluded but careful search revealed no evidence. On the other hand the presence of deep emotional conflicts bearing a direct relation to the symptoms was undoubted.

Both patients were committed from the Psychopathic to other state hospitals and at the time of writing (September 1922) are reported to show little change.

Case I: W. F., a boy of fifteen years, was admitted to the hospital May 27, 1921, referred from the out-patient department where he had been taken on account of stereotyped stretching movements over which there was apparently no control. These compulsive acts

began in March, two months previously, and consisted of a definite cycle of activity. (See figures Nos. 1, 2 and 3.) First the hands were lifted above the head in the manner of normal stretching; following this the head was thrown back almost at right angles, the chest and abdomen thrust forward and breath held in deep inspiration; while one or both hands were stretched down at the side and held rigidly with fingers separated in an awkward manner. During the latter part of the exercise the face was expressionless, eyes wide open with unseeing stare directed upwards, and the whole body strained



FIG. 1. Normal posture.

and tense. The period of apnea lasted about five seconds and was followed by sudden relaxation and assumption of normal posture, though breathing was labored for a few moments as a result of exhausting effort. In the state of apnea the patient would not respond to command, and appeared wholly oblivious to his surroundings. As soon as it was over he would usually pick up the thread of a conversation or answer questions in a way to show there was no real clouding.

This cycle of activity was subject to various minor modifications and the frequency was variable. His favorite position for carrying on the exercise was kneeling on chair or bed holding over his shoulder with one hand a coat, pillow, book or other article. The intensity varied from an easy stretching to a paroxysmal effort in which the muscle tension was profound, his face strained and distressed and the breathing of gasping character. At times he would start the act

with a good natured smile, but always at the climax a mask-like expressionless appearance supervened.

There was a history of paroxysms of these movements previous to admission in which he dropped to the floor from exhaustion, suffered from nausea and vomiting, and appeared dazed for several minutes at a time. Only one such paroxysm was observed in the hospital and this was witnessed by a physician. At that time for twenty minutes vigorous stretching movements followed each other without respite. He became pale, vomited and had to be supported.



FIG. 2. First position of tic.

There was no unconsciousness, but he appeared confused, did not answer questions and said afterward that he was not "clear in his mind."

During the first months of his hospital stay the persistence of the movements was almost unbelievable. For hours at a time both day and night one act would follow another with but brief intermission. On occasions he was reported as being up practically all night, much of the time standing in the middle of the bed. After such periods there was evidence of considerable fatigue with pale face and dark ringed eyes. Usually after 2 A.M. and for a few hours during the day he would fall into a heavy exhausted sleep. While dressing or undressing he would stop to stretch a dozen times, and at meals often stood with one knee in his chair stretching between bites. Nothing short of brute force could stop a paroxysm once begun and any attempt to hold him resulted in the appearance of marked distress.

vigorous commands from nurse or orderly would hurry his dressing and eating, and he could be kept in bed for the time that they stood over him, but was up stretching the minute he was let alone.

The patient fitted at once into hospital routine, and was at all times cheery, genial, light hearted and jovial. He was untroubled by feelings of humility toward authority, and a little overfamiliar in his relation to physicians. He showed a keen objective interest in all that was going on about him, and although he did not seem to chafe under the monotony of ward life, welcomed all chance for



FIG. 3. Second position of tic.

diversion with signs of boyish pleasure. With other patients he seldom held much conversation beyond a cheery greeting. He was at all times confident and hopeful for the future, and so optimistic in his reports of his own condition that his statements were wholly unreliable.

Formal mental examination showed nothing of special significance beyond a rather more buoyant mood than his situation might warrant. There was no evidence of delusional trends or morbid preoccupations, Intellectual functions were adequate and he had a healthy insight into the nature of his illness, looking upon it as a "bad habit." On psychometric tests he graded toward the lower limits of the normal.

Physically he was undersized, pale and rather poorly nourished, with some minor stigmata in the way of flaring ears and asymmetrical features. There were some postural changes, evidently the result of his compulsive exercises, with accentuation of cervical and dorsal

curves of spine, and barrel shaped chest. An inguinal hernia was present, otherwise routine examination showed nothing of importance. Laboratory findings including blood Wassermann were negative.

Family and Development History: The patient's parents were of Irish stock, but born in this country. Both were of healthy appearance and without sign of neurotic traits. The father was a skilled mechanic, a genial, intelligent, self-reliant man. The mother was quiet and refined, and modest to the point of prudishness. Both showed a healthy solicitude in their son but no sentimentalism. He was the fifth of eight healthy children from twenty-two to five years of age. There was one brother of ten years and the rest were girls. The home environment was of the standard type for the better class of skilled workmen. No important neuropathic heredity was brought out.

Birth and early development were normal, and he was breast fed for a year. He had whooping cough at five months accompanied by three major convulsions, but showed no serious sequelae. During his fourth year he had night terrors, usually dreaming that a dog was chasing him. These only lasted a few months and in other respects no special neurotic traits were present during early childhood. He had scarlet fever at ten years and a tonsil and adenoid operation at twelve. Otherwise there were no serious illnesses and he was considered in every way a healthy boy. In school he was rather slow and careless, and repeated the second grade. He however finished the eighth grade at fourteen and during the year preceding admission was in first class of high school though his work was interfered with by his nervous symptoms.

In personality he was sociable, cheery, frank and talkative, with the usual boyish interests. He had many friends of his own age and sex, but shunned girls. He was never a leader, rather cowardly, and easily influenced and imposed upon by others. Until the age of twelve he was not difficult to manage, but after that time showed considerable good natured disregard for parental authority and got into various minor difficulties. He was once with a group of boys who rang in a false fire alarm and was on probation to the court for a year. He took wholesome punishment for misbehavior without show of resentment. For a year prior to his illness he had been less amiable in disposition, was gloomy and easily vexed, worried over his studies and at times would cry hysterically without known cause.

Present Illness: The patient's sex development and the onset of his neurosis were intimately connected. No instruction on sex was received from parents or teachers and he was initiated into these mysteries by the usual hit or miss route. According to his own statement he learned the difference between the sexes at about the age of five, and from then on showed considerable curiosity concerning his younger sisters, spying on them and in a few instances trying to handle and even kiss their genital region. When twelve he became acquainted with the facts of physical relations between sexes. For a period when thirteen he had sexual intercourse with two younger

sisters at intervals of a few months, bribing them with candy and awakening their curiosity by exhibiting himself, several times masturbating before them. He did not do these things without sense of wrong and guilt, and finally disclosed his practices in the church confessional and claimed never to have repeated the offense. Other heterosexual relationships were denied.

Masturbation began at about the same time, developing spontaneously from handling the genitals. He commented on his surprise at the first ejaculation. He continued this practice intermittently till the fall of 1919, when he witnessed a chum masturbate before a group of boys. This chum was greatly admired on account of his physical prowess. The exhibition made a profound impression upon the patient, and from then on autoerotism absorbed more and more of his thoughts, being practiced several times daily. Moral conflict and struggle against temptation soon developed and continued increasingly. In August, 1920, a boy friend observed that he looked thin and pale and hinted that the cause was evident. This worried the patient and he struggled harder to decrease the frequency of indulgence. A few months later he again confessed to his priest and although not giving up the habit, controlled it better from then on, but with continuation of the moral struggle. During masturbation he indulged in phantasies of intercourse sometimes with his sisters, at others with imaginary persons. He denied all homosexual experience.

In June, 1920, coincident with the beginning of unusually acute moral conflict, he became sleepless at night, often lying restlessly awake till daylight. After some weeks he slept better, but in January, 1921, insomnia returned and continued unabated until admission. He was restless and uneasy and spent much of the night prowling about the room fixing his clothes and doing various minor chores. His parents tried to overcome this habit by disciplinary measures, but scoldings and whippings did not affect him. When put back to bed he was up again as soon as the house was quiet. Finally he was let alone so that the exhausted watchers could get some rest themselves. According to his statement he walked about chiefly to fight the temptation to masturbate. He began to go through various gymnastic exercises partly to aid in resisting temptation and partly seeking to gain the physical virility to which the admiration of his more robust friends and his reading of physical culture magazines led him to aspire. One of the exercises in which he became quite proficient was leaning over backward and touching the wall with his hands. The bending backward of his compulsive act, according to his own interpretation, was originally determined by that exercise, while the preliminary lifting of the hands was carried out partly to keep them away from the genital region. The compulsion developed suddenly and soon reached the state which has been described.

In the latter part of April he was sent to the Peter Bent Brigham Hospital by his family physician, who suspected an organic basis for

his symptoms. He remained there for three weeks under observation and no signs of organic disorder were established. After returning home he seemed improved for a few days, but was soon as bad as ever. His parents first learned of his autoerotic practices shortly before his admission to the Psychopathic Hospital, and during the interval kept a close watch over him both day and night, causing him considerable humiliation.

Religious Interest: The family was of Catholic faith and the patient's religious life was of considerable importance in relation to his special conflicts. Since the age of seven he had manifested rather more spiritual interest than the average boy and lived up rigidly to the formal requirements of the faith. For the year preceding his admission, corresponding to the time of most acute moral struggle with sex temptations, he showed exaggerated zealotry. He went to the church daily, often several times. His own statement was that he prayed for the souls of his parents and himself in purgatory, and added, "I wished my father and mother to live a good life when they died."

He gave up attending church shortly after the stretching movements began, but not until he had been several times carried out after falling to the floor from exhaustion in his paroxysms. He spoke frequently during this time of his desire to become a priest and still maintained the ambition while in the hospital. The attraction seemed to be equally divided between the spiritual issues involved and what he considered the desirability of the life from a more material viewpoint, such as the opportunity to spend much time driving around in an automobile on parish business. The preliminaries to such a career in the way of education and so on appeared neither to greatly interest nor trouble him.

Family Relationships: A study of this topic yielded no striking data other than the episodes with the sisters, already mentioned. Toward his father he showed no special warmth, but was on friendly terms and without morbid fear or dislike. He considered him strict but just, and felt that conflicts with parental authority had been chiefly his own fault. He wholesomely admired the father's physique and mechanical ability, but expressed ambitions to rise higher in life himself.

In discussing his mother he showed more animation and said about their relations, "there isn't two better friends in the house." He admitted he liked her much better than the other parent, but there was no evidence from him or outside sources to show that he was especially dependent. He stated that until two years before, he fitted into the domestic circle very well, but since then he had sometimes felt that he was "the nigger in the family." He was visited weekly by one or the other parent and always seemed to be at his ease and enjoy them, but showed no feeling of deprivation when the intervals were longer. A few times he went home for short visits and was always quite enthusiastic at the prospect and expressed pleasure over the trip on his return. The auto rides sometimes given

him by the father were sources of great enjoyment and he was reported to suspend stretching operations largely while in the machine. The oldest sister, married two years and away from home, seemed to be his favorite. He said that he missed her a good deal, but that her husband "deserved her and he got her." There was little demonstrativeness between any members of the family. The younger brother and the patient got on without special friction. He formerly slept with his father, but for the past five years had shared a bed with his brother. In the same room the father slept with two younger sisters.

Course in Hospital: During the months of his residence he was consistently cheerful, jovial, and optimistic. Although he did not shun companionship, he made few advances toward others and formed no special friendships. His amiable disposition made him generally popular except that his untidiness of dress and belongings and dilatoriness in response to ward routine brought him some criticism from nurses which he accepted good naturedly.

Such interest as he had outside his obsessive acts seemed objective and he was willing to assume opportunities for work or recreation which were offered, but was heedless and not very efficient. His tasks were constantly interrupted by vigorous stretching. During part of his stay he had parole to visit friends in the vicinity, and when outside controlled his compulsive acts somewhat better than on the ward. On the whole he showed very little pride or sensitiveness over his habit and in hospital as at home was affected but little by ridicule or censure.

There was very little change in the general character of his symptoms while under observation. At times there would be a transient improvement with less disturbed sleep, but a relapse invariably followed. Occasionally he mentioned getting home by a certain date located some distance in the future, but for the most part showed no discontent or boredom, always saying that the time went rapidly and pleasantly. On this subject he once said, "Stretching takes the place of everything." Another time when plans for the future were discussed, he remarked, "I ain't thinking at all, just biding along." At times during the latter part of his stay there were noted transient confused periods for a few moments following the stretching. He was rigid, looked dazed, grasped objects for support, and there were some incoördinate athetoid-like movements of the hands and arms. He mentioned vague hallucinatory experiences during these momentary confusions, saying, "things all going up like elevators with people in them." Once he spoke of "imagining" he heard the voices of his mother and sisters but later denied it.

Toward matters of sex he showed on the surface most light-hearted unconcern and discussed this topic with the greatest frankness, independent of place or circumstance. He claimed to have discontinued masturbation for two months following admission, then to have taken up the practice again in moderate degree. His abstinence seemed chiefly to be determined by abeyance of desire. He

spoke of confiding to a boy chum on one of his visits home about the two month intermission and the latter expressed astonishment at his self-control. It was not noted that the severity of his motor symptoms varied in any way according to his autoerotic practices. There was lack of consistency in statements concerning his attitude to masturbation. He said at one time that he understood continued practice would cause him to become insane. At another he expressed the belief that all unmarried men indulged in the habit. Often when meeting a physician he volunteered in a loud voice that he had not masturbated for a certain number of days and beamed with self-approbation.

All efforts in the way of treatment proved unavailing. Many hours were spent in various psychotherapeutic attempts without the slightest apparent result. He always met physicians courteously and appeared to coöperate, but seemed to welcome his dismissal, and was quite unconcerned whether he was given special attention.

Interviews were complicated by the fact that his tic was more in evidence than at other times. During them he was for the most part in a state of rigidity or breathlessness, although always amiable and without signs of anxiety. Such procedures as corrective exercise and posture he would only carry out if some authoritative person stood over him.

SUMMARY AND FORMULATION

This boy of fifteen showed a fairly normal personality during his earlier life. He advanced precociously to the sex problems of puberty and reacted poorly to them. He showed undue curiosity about his sisters, was stimulated by exhibitions of other boys and masturbated to excess. At the same time marked moral struggle developed and he sought aid and atonement through religious strivings. Severe insomnia and a state of anxiety appeared, followed in a few months by the development of a complicated motor tic.

Various hypotheses may be advanced to explain the development of the tic: 1. It may represent a simple substitution for masturbation or other crude sex activity, the stretching and respiratory phenomena giving transient relief to the sexual cravings in a way to avoid moral conflict. The patient spoke of peculiar tingling sensations in the muscles of his back and compared them to those experienced in masturbation. The fact that the symptom seemed little affected by either indulgence or abstinence of genital sexuality implied that more complex factors were involved.

2. The act might be a motor discharge which monopolized all available psychic energy; and which had developed to give the greatest degree of satisfaction and at the same time avoid the sensitive associations in a poorly organized personality, torn by distressing

conflicts. Perhaps liberty may be taken to picture the "libido" threading its way through a mass of painful complexes and finding in the bizarre exercise an outlet which gave a minimum of disturbance. In substantiation of this concept is to be noted the change from a mental state of anxiety and despair to one of complete serenity after the establishment of the tic.

3. In the motor symptom might be symbolized a striving for masculine virility both psychic and muscular in character, and indeed the exercises were originally in part undertaken with the hope of attaining a better physical development.

4. Finally the possible relation between such compulsive acts and the stereotypy of catatonic states must not be overlooked. To postulate such kinship, however, would add little to the knowledge of its genesis.

Case II: Margaret A., a married woman aged twenty-five, was admitted to the Boston Psychopathic Hospital July 25, 1921, on the recommendation of her family physician. She suffered from a compulsive stereotyped exercise, persistent and exhausting in character, which developed fourteen months previously and had continued unabated. In addition a state of chronic invalidism had supervened and she had become indifferent to her obligations and duties. Medical care had been constant with frequent changes of personnel.

The patient was the oldest of five children and without unfavorable heredity. Her home environment was comfortable and wholesome. She showed no special neurotic traits in childhood and had always been in good physical health. In personality she was reported cheerful and sociable but rather headstrong, wilful and selfish, and was usually given her own way by the rest of the family. She finished grammar school at the usual age and thereafter lived with her parents contentedly and rather indolently until a year preceding her marriage at twenty-two. At that time she left home because her father and older brother showed opposition to a man with whom she was keeping company. This was the first time she had ever been thwarted by her family, and although she later admitted that the man in question was undesirable, and gave him up of her own accord, she never forgave her father and brother. Toward her mother and the others she retained a normal affection.

After leaving home she worked in cotton mills, went with fast company, drank and was sexually promiscuous. She began masturbation at puberty and continued the habit at least until her marriage. Her husband was a man with whom she had been sexually intimate previously and the marriage was forced. He was intelligent, steady and industrious and stood loyally by her through her illness. She never had any criticism to make and claimed to love him. He was acceptable to her parents and much of her married life was spent in her old home. A child was born in September, 1920, seven months

after marriage, and the patient was deeply humiliated over what her own and husband's family would think of the premature event. Her previous lover and probable seducer kept up his solicitations till after her marriage, when he wrote a final letter begging forgiveness for all the trouble he had caused.

The first few weeks of married life were without untoward incident, then the patient suddenly developed an acute anxiety state in which she felt robbers were trying to break into the house, screamed and clung to her husband. This state of panic lasted for a week, during which time she slept but little and required constant attendance. It then gradually subsided, but until some months after the birth of her child she remained timid and apprehensive, seldom leaving the house, afraid to be in a room alone, and refusing to have her jewelry about her for fear of robbers.

In May, 1920, her compulsive act developed. It first appeared after being reprimanded by her husband for lying on the bed in a draft of cold air. Her nose felt blocked up by some peculiar and offensive substance and she started a spasmodic blowing to clear it out. She was soon convinced that nothing of significance was wrong with her nose, but continued the blowing, which soon developed into the complex respiratory tic which brought about her hospital admission.

This activity gradually absorbed more and more of her time and her mother and husband assumed all household duties. Her tic only operated while in the recumbent posture, but she insisted on staying in bed a good part of the time indulging in it. Occasionally she would rouse herself, become interested in some excursion and be out with her husband for hours without sign of the symptom. Most of the time, however, a majority of the waking moments were given over to her tic. The slovenliness of dress and habit and untruthfulness which developed with the neurosis were emphasized by the family. No clear cut delusions or hallucinations were ever in evidence. At one time during her acute state of panic she called attention to the pictures on the wall, which she thought were moving about in a peculiar manner, but she was easily reassured and did not refer to the topic again.

Marital sex relations were significant. For a time she showed marked hypersexuality, but following the birth of her child developed a complete frigidity which persisted, although relations were kept up till the time of admission.

Her respiratory tic followed a definite cycle performed as she lay flat on her back. First she inhaled deeply and noisily through the mouth, at each breath moving her jaw from left to right and slightly protruding the tongue. The inhalations grew faster, deeper and noisier till all reserve muscles were in action and the chest worked like a bellows. After fifteen to twenty of these inspirations a climax was reached; she would stop breathing, press against the sides of her nose with the first two fingers of each hand, blow for a few seconds till her face became suffused, then suddenly let the air go

through with a loud trumpet-like blast. During the expiratory phase her whole body was tense and tremulous and she usually drew up her legs with little regard for modest covering. For a brief period following the expiration her face would be vacant and strained, and her arms held up rigidly and awkwardly with peculiar ataxic movements, giving a momentary picture resembling catatonic attitudinizing. At times there was a period of rest following these cycles; again another would start in immediately and continue in indefinite series till for hours day and night the ward would resound with the sound of her breathing. Occasionally the climax was not easily reached and she would continue the inspiratory phase till forced to stop from exhaustion. The whole episode took on a grossly sensual character and in the climax, similarity to the sexual orgasm could not be overlooked. The patient's husband commented on the resemblance to "passion." She consistently denied any sexual sensation, at least of genital location. At no time was she out of contact with her environment. She grasped questions and could usually be diverted momentarily at any phase long enough to answer them.

Physical examination showed a woman of average size and development. The nose was high bridged and thin, the mucous membrane harsh and dry but not otherwise diseased. She breathed through her mouth and in repose her face had a toneless vacant expression. She would brighten up when interested, and make a good appearance. The blood pressure was low with a systolic between 90 and 100. Otherwise routine physical examination was wholly negative. Laboratory examinations, including blood Wassermann, were negative except for a persistent eosinophilia varying from 8 to 15 per cent, the cause of which was never determined. The stools revealed no evidence of parasites.

Formal mental status showed a lowering of normal affective response to her illness and situation, with a general attitude of resigned indifference. No morbid mental content was brought out, intellectual functions were satisfactory, and she had fair insight, looking upon her compulsion as a bad habit which she could break in time. She graded within normal limits by psychometric tests.

During the three months she was under observation at the Psychopathic there was no improvement in her tic and her general condition changed but little. It was necessary to have her sleep and rest on the disturbed corridor owing to the annoyance to other patients caused by her noisy exercise. Much of the time it was impossible to keep her up and about during the day; if denied a bed she would lie on the floor. At other times she showed interest and mixed pleasantly with other patients in occupation room or at recreation. Her attitude toward nurses was fault finding and she reported fancied neglects of minor order. With physicians she for the most part displayed a frank and respectful manner.

She had a ravenous appetite and showed more animation over food than any other topic; indeed, food and tic seemed to fill her life with gross sensual satisfaction. Her mood was variable. For many days at a time she would smile amiable greeting if approached, but if let alone seemed indifferent to the outside world. At other periods she

would urge for permission to return home and cry in a blubbering, maudlin sort of way when her solicitations were denied. Mention of her child always brought emotional response and she never broached the subject herself. She claimed a strong desire to get better, but this proved to be largely verbal, and her statements on all matters were variable and unreliable. She was exceedingly untidy about her person and room, and in regard to these matters showed little pride or self-respect to which appeal could be made. The picture she presented if left for a few hours to herself was most unpleasant; the bed disordered, food and dainties brought by friends scattered about, her hair tangled and nasal secretions dried on her face. In this condition she resembled a person on a debauch of drugs or alcohol except that she could be forced to normal response at any time.

SUMMARY AND FORMULATION

In formulating this case many features are found similar to those in the boy described previously. This woman was spoiled and undisciplined throughout her childhood. As she grew older she showed lack of ambition and serious purpose and had difficulty in managing the cruder instinctive demands of her sexual nature. She met her first real obstacle to domination of the family when her father opposed a love affair. On account of this she left home, embittered at her treatment, and soon got into dissolute sexual habits. She married a man who knew little of her past life and to whom she looked up as much superior to herself. At the same time she was torn by a greater attraction to another man less desirable in every way. She confided her feelings to no one and worried over what people would think of her premature confinement. The fact that she was to bear a child no doubt intensified the conflict between her better nature and the memory of her inglorious past. She lacked the stamina to adjust to this situation other than by repression.

The anxiety attack soon after marriage may be looked upon as a breaking through of affect displaced from the repressed material. The development of her tic soon after, appears in the nature of a conversion hysterical production, less painful and more fixed than the anxiety state, furnishing an outlet for her strong sexual libido, and serving the double purpose of absorbing her interest and avoiding her conflicts. The gradual development of emotional deterioration proved the success of this mechanism in establishing a complete detachment from the world of painful reality.

In each of these two cases the history of poor management of the sexual problem; the resistance to all attempts at treatment and personal influence; the chronicity of course, indifference of mood, and developing signs of habit deterioration, make a formal diagnosis of dementia precox seem warranted and the prognosis unfavorable.

INSANITY AS A DEFENSIVE PLEA IN CRIME *

A CRITICAL REVIEW

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Insanity is a protracted morbid deviation of the normal mental condition and conduct of the patient, which incapacitates him to feel, think, and act in relation to his environment, in harmony with the standards of his bringing up, such as would entail a danger to himself or others. This definition, as Adolf Meyer¹ says, while suitable for cases for commitment, is not strong enough for those who would have insanity mean irresponsibility.

Hamilton² states that there has been but little advance in the legal idea of insanity, in spite of the great recent strides in Psychiatry since the days of Lord Hale and Sir Edward Coke, 300 years ago. Up to the time of Pinel, the insane were managed like criminals.

Lord Onslow held, as late as 1723, that a man was exempt from punishment who was totally deprived of his understanding and memory, and who did not know what he was doing, any more than an infant or a wild beast.

Erskine first laid down the idea of delusion, as the real test of irresponsibility, after Hadfield had attempted to assassinate George III in the Drury Lane Theatre. In 1812, in the Dillingham case, it was stated that a man's disease must show that he was unable to distinguish right from wrong, this being the beginning of the "right and wrong idea," denoting liability. Some other factors have been suggested, as the question of self-control, etc., to establish responsibility in criminal cases.

The legal definition of insanity as formulated by the English judges in 1843, in the celebrated McNaughton case, is defined in about the same way as in the present New York Criminal Code.

Neither the terms "insanity" nor "responsibility," so much

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used in Law, are at all useful in Medicine. Their chief *raison d'être* is that they are of service in medico-legal trials. It is well known that a genuinely insane man may act intelligently and advisedly on many matters.

The term "moral insanity" dates back to Pritchard's "Treatise on Insanity," published in 1835. Both "moral insanity" and "moral imbecility"—made familiar by Lombroso—are faulty designations from a psychiatric standpoint. For they represent secondary or consequential conditions, and are not primary mental affections. It would be just as rational to speak of an Esthetic Insanity, or of an insanity qualified by some other complex affective state, *e.g.*, patriotism, sympathy, etc. Instead, one should rather refer to the primary and fundamental condition as a Mental Deficiency, Senile Dementia, etc.

Expert evidence, as Dercum³ says, differs from ordinary evidence—the latter being the recital of facts—in that it is essentially opinion evidence. It is a fact beyond contradiction that the personality of the medical expert, and his manner of giving evidence, may have greater weight with the jury than the evidence itself. This is rather unfortunate, for the personality of the witness ought not to have any real determining influence.

Sajous⁴ says that the term "expert" is employed usually in legal work. In relation to the management of illness, the term "specialist" is preferably employed. An expert is one who, because of study, capacity, and experience, is able to give an opinion as good, or better, than any other opinion on a particular subject. An alienist is a medical expert who interprets mental phenomena in accordance with the dictates of the legal idea of what constitutes insanity. A psychiatrist is a mental specialist who diagnoses and treats abnormal mental disorders according to the dictates of medicine. He is usually also a psychopathologist, *i.e.*, one who is expert in mental analysis and interpretations. A man may be a fairly good alienist, and yet only a mediocre psychiatrist. Usually, however, the real alienist knows his psychiatry, and is especially well versed in legal procedure.

A crime is an act that subjects the doer to possible punishment. Mercier⁵, who was probably the most renowned alienist in England, wrote a very delightful book on "Criminal Responsibility." The psychiatrist may differ with some of the things he says. But he is very logical and consistent in interpreting the law. I present his main ideas which I have abstracted from his book.

He says that crime has to do with an outward act, and the state of mind which prompted the act. He counsels the expert to stick to the law, and not to confound "is" with what "ought to be." Responsibility means being rightly liable to punishment. Rightly means according to the average common sense.

The aim of punishment is: 1. Retribution—the most important, he states; 2. As a deterrent; 3. To reform. (Many psychiatrists differ with him here.)

The state of mind demanding punishment is called "justice"—the essential idea of which is equality. It acts on the principle of "An eye for an eye," etc. Justice differs from benevolence in that there is no retributive element in the latter, which is based on affection, and not on equality. Retribution must not be personal, but for the general good.

A criminal action must be voluntarily done, and must be preceded by volition, and be consciously directed toward some aim or end. Choice, implying reason, must precede volition; desire precedes both.

Intention is necessary in all crimes, except those of negligence. An intention is a more proximal motive; the act being to produce immediate consequences. A motive is a more distant intention—that is, the act being for less obvious consequences. The law considers especially the proximal consequences—intentions rather than motives. (A. shoots B. through the head. His intention is to kill him; his motive may be any one of a number of reasons.) The two—intentions and motives—cannot always be differentiated with certainty.

Wrongdoing is where one seeks gratification by an unprovoked act of intentional harm. The question of right or wrong depends on the motive for the act, and the liability or responsibility, being responsible if he knows the circumstances under which the act was done.

A disorder of the faculty of knowing or judging is certainly the important legal test of irresponsibility. (One might go further and include a disorder of willing.) The law does not include feeling in determining the liability for a crime. Of course, no delusional person should be held fully responsible.

Conduct is to satisfy desire. Comparison and weighing is known as deliberation. One chooses after considering alternate modes of action. An obsessive, impulsive act against the inclination of the actor, and without a motive, is not normal, and indicates irresponsibility. Responsibility is attached to wrong acts only.

"Knowing the nature and quality of the act" is a poor legal phrase, for the accused may know the nature and quality of the act, but may not know, nor appreciate, the circumstances under which he was acting, nor the consequences of his act. In the English law all hinges on the word "know."

So, summing up Mercier's ideas, the accused must will the act; intend the harm; commit the act for his own gratification, on inadequate provocation; and in addition, he must know and appreciate the circumstances under which the act was done. If any factor is absent, the responsibility is less, or is absent.

Tests for lack of knowledge are easier to apply than tests for lack of will. Knowledge has its degrees; the accused may know the act is wrong, but may not know how wrong.

Self-control is a moral virtue, being the foregoing of present pleasure, for later greater advantages. It is chiefly a matter of will, and if practiced leads to prudence; if absent, vice may result.

He advises the alienists not to fence with the cross-examiner's questions; to give brief answers; and to omit illustrations. Mercier says the best procedure is to have a committee of two or three alienists or psychiatrists to examine the accused, separately, before the trial. This is a very good suggestion.

Causes: Psychiatrists lay a great deal of stress on the psychological factors involved in the commission of the crime. It is true that many criminals are mentally abnormal. Many are morons. It is in estimating the borderline cases where controversy arises. To merely claim that a man is a psychopath and to infer that this spells irresponsibility would be disastrous for society, for practically all criminals can be referred to as psychopaths. A serious personality study is necessary to give a *bona fide* estimation of the criminal's mental status.

Shanahan⁶ says that most inebriates, vagrants, prostitutes, and paupers are mental defectives. Their moral sense is abnormal, and the ordinary passions of man are exaggerated in them; and combined with this, they have a lessened self-control. He says that a person can go through high school and yet be a defective. He also says that 30 per cent of the inmates of prisons and reformatories are mental defectives. At the time he wrote his article he said that there were 200,000 defectives in New York State living outside of institutions. Being high grade morons, many of them were dangerous, if antisocially inclined; more so than the much lower graded imbeciles, who, being extrasocial rather than antisocial, were already

under supervision. Yet imbeciles, having no moral sense and but little will power to control their passions, can be extremely dangerous. A former superintendent of the Elmira Reformatory in New York, an institution for delinquent youths, said that 60 per cent of the inmates were physically or mentally below par.

The moron who becomes a criminal does so, not so much because his desire to commit crime is stronger, but because his moral restraint and self-control are weaker. However, it has been held that a high grade moron may be partially responsible.

Karpas⁷ says that the instinctive life or the unconscious is often the determining factor in the commission of antisocial acts. He says that too much stress is laid on the intellectual life, and not enough on the emotional-volitional spheres as factors in the production of crime; that crime is the result of disposition and training on one side, and the social condition on the other. But this is true of all conduct.

Heredity and especially environment stresses play a rôle in influencing the commission of crime in certain types of individual, many of whom suffer from permanent, but not necessarily progressive defects, these being rather character anomalies than diseases. This does not mean all such, however, are to be regarded as legally irresponsible.

Healy⁸ makes the statement that if a boy reaches the age of eighteen without committing an antisocial act he is quite apt to remain a good citizen.

In an address before the New York Neurological Society, Glueck⁹ said that in fifty consecutive prisoners admitted to Sing Sing prison, only thirteen were free from serious physical or mental defects, and that 60 per cent of these were nervous or mental cases.

Carlos McDonald and Austin Flint¹⁰, in a report of an investigation of the Matteawan State Hospital for the Criminal Insane in New York, said that among the prisoners were a large number with paranoid trends, and little or no deterioration. As they had no insight into their condition they thought that they were being unlawfully detained. This is the type that repeatedly seeks freedom through writs of habeas corpus, and who are persistently seeking the aid of the press and the public, because of their being "falsely" imprisoned. They are often very logical in their reasoning. Many of them belong to the most dangerous class of the insane.

There are certain types of people who would almost never break down under any stress, and others who would easily do so. As

Meyer says, the comforting tradition that hysterics and neurasthenics do not become insane cannot be substantiated by experience. In the case of an epileptic, one must not only think of the convulsive attacks and of the possibility of deterioration, for the amnesia found after the attack is often of greater value medico-legally. Cases of petit mal deserve special consideration.

Responsibility: In my opinion, the ordinary claim of a fleeting temporary insanity in criminal cases is a subterfuge. One wonders why certain experts who testify to this preach quite differently in their clinical lectures. True, there are cases which are puzzling. Take for example the amnesia following an epileptic attack, which Shanahan of Craig Colony for Epileptics says is the rule. The accused would not be responsible for a crime committed during the amnesic period. However, a study of his personality and life history would usually show that such an individual might commit a crime at any time, and so should be removed from society for all time. His experts should say as much.

A class of patients who are difficult to deal with are those who have delusions of infidelity which they may not openly express. In fact, even at a trial they may deny their delusions. Of course, the law starts off with the presumption that a man is sane until shown to be otherwise. As Gordon¹¹ and others say a paranoiac may realize the unlawfulness of his act and yet not be able to control himself. This is true in certain cases only.

Remissions frequently occur even in severe psychoses. During these remissions the patient may be quite irresponsible, and may yet know right from wrong in the abstract. But such a patient should not be freed as soon as the episode is over. In fact, the nature of his psychosis might indicate that he needs institutional care for the rest of his life. The protection of society is the important desideratum: whether he is so unreliable that it is dangerous for him to be at large; this is a more practical viewpoint than the sensational quibbling we see in many murder trials, where one side says he is quite insane and the other that he is perfectly sane. He cannot be both.

Frank cases of insanity are usually so evident that no controversy arises concerning them. It is the borderline—and often very doubtful—cases which give rise to disputes. How much better it would be in these cases if they were kept in a hospital under constant scientific observation, instead of in a jail, where proper study cannot be made. Needless to say, perfunctory visits of jail physicians with no psychiatric training are of little value. From proper observation

there would be less disputes and fewer delays in concluding a case. Cases held too long before trial are usually well tried in the press by sentimental lady journalists. This usually creates a generally bad atmosphere. Though it is unethical, some lawyers are not averse to giving public expression to their opinions on cases in which they are interested.

It is rightfully regarded as suspicious where the request for a psychiatric examination is delayed, and also where the plea of insanity is made late, apparently as a defense of last resort. And as Adolf Meyer says, where the defense of the criminal is the main (and only) thing, and insanity the only means of saving him from the consequences of his act, the procedure is usually from the start a perversion of psychiatry. It cannot be denied that a large part of the public and not a small part of the medical profession have a cynical disregard for the opinions of experts. Of course, no conscientious expert would willingly subscribe to any fraud. And yet, why the gulf so frequently seen between the alienists for the defense and those for the district attorney?

I am quite convinced that the following is a true and not a rare situation: A millionaire's son commits a murder. His family work up an interesting story. Some clever lawyers are employed. An alienist is approached and told by the family and the lawyers all about the "insanity" of the accused. If one accepts all of their story as true, the accused is insane. And it is right here—and emphasis must be laid on this point—that trouble starts. In this way an attitude is created. And an attitude merely expresses feeling, being a state of mind indicating purpose. A mental opinion, like any other opinion, to be valuable requires study and deliberation to substantiate it. Do the alienists gullibly accept all that is told them, or do they try to probe or break down the story given them? If they are able to discredit the story they will not be wanted. If they do not do so they may be careless. For if they do not study the case from all angles as they would in one of their hospital or private consultation cases, with no attitude but to get at the facts, they are not playing the game right. There is no doubt that a sympathetic attitude toward the family of a criminal with unlimited money, and a careless examination which brings out few facts, and a theoretical acceptance of all told them, without making a comprehensive study, causes many a man to make a wrong diagnosis. This sounds theoretical, but I believe it accounts for a great deal of the differences between experts. Else why is it rich murderers need so many alien-

ists and poor ones none? At any rate, the feeling is broadcast that friendship and excessive fees can lay a basis for bias.

To "know" the difference between "right and wrong" and to establish the question of liability or "responsibility" are law's chief criteria in passing on a given case. Of course, the average jurist allows some latitude in the estimation of these points. Some physicians say that the present way of handling these criminal cases is stupid. Yet it must not be forgotten that Law has been founded on long experience, and while the procedure is not perfect, some of the ideas and recommendations of certain "parlor medical psychologists" are absurd. They dwell lengthily on the fact that crime is the individual's reaction to his social environment, and before they end their argument one wonders if they want to punish society and martyrize the culprit. Would they have the law founded on the unconscious when even we, as physicians, find it difficult to study unconscious motives in a patient who coöperates? We would get nowhere with a murderer on the defensive. If the interpretation of the law on these cases were in their hands there would be no law.

Of course, as White¹² says, you cannot adhere absolutely to the test of "knowing the difference between right and wrong." White also claims that the average jury cannot pass on much of the highly technical psychiatric material brought out in many of these trials, nor can they always appreciate the relative value of the qualifications of the different experts; they can better judge his manner than much of what he says. So that the testimony of a good expert with a poor manner may carry less weight with them than a pseudo-expert with a captivating, forcible manner.

Here I will quote a lawyer, Fenning, of the Washington bar, whose ideas might be compared to those of the alienist Mercier. He says that insanity, to excuse a crime, must not be the mere impulse of passion, or idle, frantic humor; that intent, deliberation, and premeditation are important factors in determining liability. Like Mercier, Fenning pays too much attention to the crime and not enough to the criminal. Opinions founded on prolonged observation are more valuable than snap judgments founded on little or no observation. While it is probably true, as Mercier says, that in court the expert must deal with "what is" and not with "what ought to be," still outside the court we must always aim for the correction of any known defects in procedure. And it is true, as one critic says, that a court is not a lecture room. But it is a wonderful laboratory in which to study human character, and the opportunities to do so should be

seized. And as Glueck¹³ and others say, the study of the criminal to us is of greater importance than only the study of the crime.

Gordon¹⁴ says that every normal person has a proper feeling of right and wrong which is made more appreciative by his intelligence.

Clouston suggested that the man's power of self-control should be the test of his liability; and Forbes Winslow states that the true test of responsibility should be whether the accused had lost all power of control over his actions—whether he had the will power (wish, according to analytical psychology) to do or not to do a certain act. The practicability of this would be doubtful in most cases, and in just those borderline cases over which we see so much controversy.

And Adolf Meyer rightfully says that even among the insane there is no absolute irresponsibility. Absolute responsibility and absolute irresponsibility merely denote two theoretical extremes. This is true in regard to nearly every field. There are all sorts of gradations between perfect beauty and absolute homeliness. And Regis says you cannot divide all mankind into only two categories—the sane and the insane. And of course the law also states that because a man has a psychosis it does not mean that he is absolutely irresponsible in all directions. And this is true, because though a person is ill, say with a depression, and needs commitment for purposes of treatment, this does not give him *carte blanche* to commit any crime on the calendar and then not expect to be dealt with by the law. In fact, the caustic criticisms of some physicians that a man certifiably insane for purposes of treatment would be sane on the “to know right and wrong” idea of the law is ill-founded. This is another place where the practice of the law is superior to that of the theories of some alienists.

Numerous factors often lead up to a crime. That is why, beside a careful medical and mental examination, the full life history and the personality makeup of the criminal should be studied. Without doing this the physician cannot fully and intelligently assist the court and jury by his opinion. Where hate is the motive back of a murder, as it frequently is, the expert must not conclude that this must indicate a paranoid condition, when a little careful study would show that the act, though immoral, was logically done (for revenge) and was not the result of an insane delusion. All people who hate—both the sane and the insane—invariably feel that they are in the right. It is well to remember that envy and jealousy are the two most conspicuous forms of hatred. Usually one hates only a person who was once loved. A murder should be studied carefully to see whether fear or anger was the underlying motive. Anger represents an active

passion and it induces the person to action; the act gives gratification and thus has a pleasurable element; whereas fear represents a passive or defensive feeling and tends to paralyze action, and it has no pleasurable element. This is particularly true of morbid fears.

Of course, an act of murder in itself does not indicate insanity; otherwise all murderers would have to be regarded by this standpoint, and not a special few. And jurors naturally look askance at a claim of a fleeting temporary insanity. The way in which the act was carried out, however, may be important. Needless to say, a deliberate murderer offends society more than does an impulsive murderer. In analyzing a criminal act one must try to determine whether it is the result of an exaggeration of a normal passion or of genuine insanity, or of mental defect.

I will only say a few words about malingering, or the simulation of insanity—and we regard it as simulation where symptoms or signs are consciously created, or, if present, are exaggerated—for purposes of deception. The opposite condition—*i.e.*, the simulation of sanity by the insane—we also see, according to Mills¹⁵, more commonly in civil cases. Simulation in military and naval prisoners is not unknown; often a real insanity in prisoners is overlooked. Gordon claims he never saw a case of simulation, and Diller said he saw only one. In my army experience in the late war¹⁶ and in civil practice I have seen about a half dozen cases. One was a youth who murdered his sister after a quarrel, and after two of us let his lawyer know that we could not see that he suffered from any insanity, he dropped this defense and won an acquittal by a story of accidental shooting in struggling for the revolver. This was not the history given us. And we had the youth in a hospital for a month.

I will briefly review some of the criticisms directed against the medical and legal views and attitudes on this question.

Criticisms against Experts: Not only judges and lawyers, but also the laity and many of the medical profession often adversely criticize expert medical witnesses and their testimony. There is sometimes just reason for this. And I will disregard the ignorant type, who is willing to pose as an expert surgeon, gynecologist, psychiatrist, or what not, etc., not knowing his limitations. Finding fault is rather useless unless you can correct the situation.

The chief point worth studying is why experts of undoubted ability come into court and give diametrically opposed opinions. Here is where the public get their cynical idea of experts' testimony and where the courts are often dumfounded by the clashing opinions. While it is true that an alienist does not have to prove the form but

only the fact of insanity, his unwillingness—after positively diagnosing insanity—to state the form may imply that this is not due to modesty, but to ulterior motives. (Not to indicate an incurable type needing life residence in a hospital, etc.)

There is no doubt but that frequently the opinion of some alienists in certain cases expresses more their attitude than anything else. For when an absolute opinion is given after a cursory examination in a doubtful case, this is hardly the way the real psychiatrist acts in his civil cases. Such an alienist may listen to a colorful story by the family, with exaggerations where it is worth while. If the family is wealthy and the prospective fees are enormous, the alienist may assume a very acquiescent attitude. Else why do we see disputes only in wealthy criminals? Or is it that poor criminals are everyday murderers and rich and socially prominent ones are psychopaths? I have seen men who well knew their mental diseases get into a bad quandary rather than admit they did not know the answer to a certain question, or admit—as they would in a clinical hospital (civil) case—that maybe they were wrong. The law smiles at some of the attempts made by certain alienists to designate a criminal as a constitutional psychopath, and thus infer that he is irresponsible. This term might be applied to nearly all criminals. And every alienist without one exception will admit that all of the inmates of our prisons have psychopathic traits—and usually many of them.

A psychopathic trait means nothing more than an odd or eccentric characteristic, and, as Healy¹⁷ says, this does not connote insanity. It is not a legal excuse to indicate irresponsibility to say that a person has psychopathic traits, nor that he is neurotic. The latter might be said of a large part of mankind. If such a person were sent to a criminal insane asylum, where he does not really belong and is not wanted; he might be discharged a year later as “cured,” though his traits remain. If the best that an alienist can testify for a criminal is that he is a psychopath and therefore insane (?), he is traveling on thin ice. The alienist must know that it is just for the psychopath that we need laws. Society does not need to be protected from normal people. For normal people usually do not commit crimes.

The expert must know that the criminal psychopath is selfish. There is no mental conflict over the commission of his act, as there would be in hysteria or even in an early dementia precox patient. The acts of genuine compulsive or obsessional neurotics are always defensive acts, never aggressive acts. In the case of the criminal, the contrary is true. It is important to remember this. It is often used by the defense in criminal cases, when nothing more tangible is

at hand. But some eccentric character traits alone do not spell insanity or irresponsibility. A cold, deliberate, immoral, pseudo-respectable criminal is as a rule a criminal not because of insanity, but because of a lack of culture, decency, morality, and sympathy for his fellow man, with no altruism, but an excess of selfishness. In fact, it is the above type of cases particularly that has brought scorn on medical expert testimony in criminal trials. These are the cases which make rapid "recoveries" soon after the murder, adding another element to upset the public's confidence in expert testimony.

Medical Criticisms of the Legal View: Modern psychiatry, of course, is opposed to an absolute limitation on the question of "knowing right from wrong." There is no doubt that most of these cases are badly studied before trial—so that one hears a great many foolish generalizations—on the part of both lawyers and doctor, which are not warranted by the known facts.

One sees only rarely cases where the prosecuting attorney is almost vindictive. I once knew of a case where one of them seemed glad that a man indicted for a lesser crime was safe in an insane hospital—but he became irritated when the man was discharged—and then took the attitude that the man was never insane. This was illogical. For many genuinely insane patients do really recover as our hospital records show.

The main contention in these cases should be as to whether the man was safe to live in society. I know of two instances of murderers being acquitted by the false testimony of relatives. One of them was a habitual criminal. It is true that the law has a different standard as to what constitutes insanity, depending on whether the case be one for commitment (treatment), or for testamentary capacity, or for criminal responsibility. And yet law is not so illogical here as some medical critics would have us believe. For a man may have a severe enough depression to need commitment for treatment; yet why should that depression prevent his making a valid will—and why should a man with a mild depression be permitted to commit any crime on the calendar and then plead irresponsibility because of his depression, when very likely he was quite responsible? Meyer expresses a somewhat similar idea in an article from which I have already quoted.

As Townsend¹⁸ says, if the "knowing right from wrong" test were rigidly applied, more than half the patients in our state hospitals for the insane could not successfully defend a plea of insanity. However, as anyone having any acquaintance with our courts knows, judges are very fair in allowing any evidence showing real insanity to be

brought out—so that, as a matter of fact, the average real insane man is given every opportunity in court to prove his irresponsibility. We all know that insanity shows particularly in the fields of the emotion and volition. However, the intellect is nearly always concomitantly involved. It is rare for—say a patient suffering from dementia precox, with a predominant emotional-volitional disturbance, to fail to show an intellectual impairment if observed long enough. But if law were to accept as a sufficient criterion to denote irresponsibility, a patient's or his family's "say-so" that he could not help committing murder, because of a poor will power, or because of an abnormal state of his feelings, every criminal would take his cue—and we would not have any law. Yet there are some impractical "psychologists" who preach along these lines.

Most paranoiacs who reason well, but from false premises, are not hard to diagnose, if studied long enough.

A lawyer, Kelly,¹⁹ writing in the *New York Medical Journal* said that the reason for the conflicting evidence of experts is due to the distinction that exists between the medical and legal views of insanity. This opinion by no means covers the subject. There are lawyers who have no real idea of what insanity is, but who are perfectly willing to accept a "good" case—if they think it is personally worth while. The average lawyer's idea of insanity is no better than the average doctor's conception of correct legal procedure. Because of the chaotic state of this whole question, especially concerning borderline cases, many excellent psychiatrists prefer not to do much court work. Thus White refers to a habit of some lawyers, of running through a list of experts, trying to get one who will give a favorable opinion for their side—and usually they do not search in vain.

There is often too much abusive criticism by both doctors and lawyers which does not help to clear the situation. One cynical lawyer writes that medicine is not an exact science—that at its best, its diagnoses are little better than guesses enlightened by experience. Will, his medical opponent can justly say "Nor is law an exact science—for do not lawyers differ on every case; do not higher courts reverse lower courts, and maybe, years later, in a particular case, the U. S. Supreme Court reverses the highest State Court—and in so doing, the justices even then will differ with each other—say, five to three?" And do you not remember that when a well known murderer, some years ago, escaped from the Matteawan Criminal Insane Hospital in New York to the State of New Hampshire, that the doubt, as to whether he could be legally returned to the Commonwealth of New

York, took nearly a year to decide. It looks like a simple point—yet, it must have been complicated to take so long to decide. It need not be stated that the family of the accused rated its wealth in millions.

A frequent criticism heard, concerns the large fees received by medical experts. Large fees are only justified when they represent a large amount of work done by one who regularly commands large fees. There are instances where the fees are out of all proportion to the amount of time spent in studying the case. Suspicion is naturally attached to opinions given under such circumstances.

The criticism that some physicians use language which is too technical to be understood by a lay jury is true in some instances. However, the failure to be understood does not rest fully with the medical expert, but in part, is due to the questions of the cross-examiner, and to the fact that the latter often confounds insanity, dementia, and idiocy—treating them as being similar conditions.

Our best judges are nearly always courteous to the expert witnesses. Personally, in over twenty years experience, I have met only one who was not. But the literature records instances to the contrary. And the rulings of some courts on the question of expert testimony are rather unique. One judge ruled that the testimony of the physician who treated the patient, even though he was not conversant with the subject of insanity at all, deserved more credence than that of the expert, who had no personal knowledge of the facts. Another judge said that the opinions of the neighbors of the accused, on the question of mental unsoundness, was worth more than the opinions of all the experts in the country. This is ridiculous, of course. The statements of the general practitioner or neighbor as to the speech and conduct of the patient are valuable—but their opinions are in many instances, useless. In fact, those of us who treat cases of insanity in general hospitals, know how scant are the observations of ordinary (not psychiatrically) trained nurses. I have repeatedly seen them note on the hospital records "Patient is rational," in well advanced cases of dementia precox; and when one demonstrates to them their error by easily bringing out erratic speech and conduct, their only comment usually is, "He did not say (or do) that before."

• In a remarkable instance in a New York court some time ago (*People v. Robin*, General Sessions, New York, 1912), the judge discarded the opinions of eleven alienists—(those for the defense, district attorney, and the court), who stated that insanity was present. A conviction was obtained and the judge told the jury "He took off his hat to them."

A Cincinnati judge made the statement that the best doctors would testify to anything for a sufficiently large fee. This evoked a spirited reply from Landis, his inaugural address being entirely devoted to his answer. He said that charges of corruption are easily made and hard to prove; that there are scamps in both professions. He refers to the disrespect that some lawyers are held in, yet says, that for this we should not villify the whole legal profession. He refers to the omission of important facts from the hypothetical question on which the lawyers asks the physician to base his opinion. Landis evidently felt that he had a mission to perform, and proceeded to make a severe attack on a certain type of lawyer—of the ambulance-chasing and blackmailing type. He spoke of the browbeating of witnesses on the stand, not to bring out the facts, but merely to belittle and to discredit the witness, even though there was no justification for this. Next he notes the careful exclusion of certain important testimony which is really necessary to get at the facts in a particular case. He asks if medicine follows any such procedure to solve its problems. He claims that all this causes contempt for the law. And then he asks which profession more urgently needs a house-cleaning—law or medicine? He admits that the unscrupulous attorney who wants perjured testimony can hire an unscrupulous doctor, but he says the major portion of both professions is not so constituted. However, hurling vindictive criticisms against each other will never help any system.

Carlos McDonald quotes Mr. Justice Willard Bartlett as saying that he would not be treated by some of the doctors of certain judges whom he knew; that a man might be a good judge of the law and a poor judge of doctors. And yet a judge might, and often does, select his own doctor and friend for any medico-legal preferment in his power.

Crimes committed during so-called lucid intervals create much discussion between cross-examiners and experts. It is too big a subject to go into here. The so-called clear intervals in certain diseases—*e.g.*, in senile dementia, are often of doubtful lucidity.

The criticism of certain members of the medical profession that law has no valid standard as to insanity is often far-fetched. There are certain relationships that cannot have a set standard. What, for example, is the uniform standard for a perfectly happy marriage? It varies with the individuals.

One writer stated that some people have an idea that half the world is off, and the other half not quite on; and he adds "a better definition (of insanity) we have not." This statement sounds rather

odd coming from a scientific writer. Certain people still retain the strange notion that the insane are a peculiar subdivision of mankind—not at all related to other beings. As a matter of fact, many of them retain certain of their faculties fairly well intact. It is true, as L. Pierce Clark²¹ says, that the law has no single nor general test for even imbecility. However, the law usually handles the social aspects of this question fairly well. Law is conservative and progresses slowly—possibly too slowly; it is bound by precedents and traditions and has not yet been able to incorporate in its procedures all of the advances of modern psychiatry. And it must protect society against the ultraradical ideas of a certain type of people who would make all crime an evidence of insanity.

As we are viewing this subject from all angles, let me quote a severe medical critic of legal procedure. Hallock²² says that by training and habit the legal mind is against every new proposition; that it seeks objections before it will approve. He says that law is the most self-satisfied and self-seeking and the least scientific of all professions, and disregards the progress and reform which the people want. The training and point of view of the physician differ—one being to help and save; the other being to win his case, which must bring punishment or pain to one of the parties in a controversy. A lawyer is not averse, for example, to take certain sayings out of their setting to prove or disprove insanity. Such an aim, of course, is not to get at facts, but to win his case. In fact, to win the verdict, is the aim of every lawyer. Purrington,²³ an attorney, writes this and further states, quoting from a clever cross-examiner's book—"Bring out such scientific facts as will destroy the weight of the testimony of the opposing expert." One cannot fail to notice the frequent objections and exceptions taken during a trial to prevent the admission of damaging (though truthful) testimony. So the contention often made that medicine considers the individual while law considers society, would seem unwarranted if one were to form a judgment by basing it on the procedure in some trials. The lawyer for the average dangerous criminal does not seem concerned whether the good of society demands that such a man should be quarantined. True, a man is not guilty till so proven. But a rich criminal usually has a bevy of lawyers—and they invariably follow the general rule—to win the verdict. One never heard of a lawyer being ostracised for sacrificing facts to win his case. In fact, by so doing he is called clever; and if he can habitually do this, he commands big fees. The real facts are often of secondary importance. Where a well known crook escapes punishment on a pure technicality, and not because of

the merits of his case, does his lawyer brood over it? Does he fret over the travesty on real justice? Hardly. Legal technicalities are really very bad for the public weal. And so the public wonders why it is that a rich or socially prominent criminal can almost always evade the law; even if he has to plead "insanity" as a defense of last resort—the insanity being merely based on some eccentric character traits. The public, of course, knowing little or nothing of law or medicine, nor of psychology, philosophy, or insanity; but having a practical idea of the power of money, infer that the latter is the dynamic power which stirs both the lawyer and the expert. Of course, public opinion is sometimes in error.

The emotional equation is very important. This is particularly true where women are tried for capital offenses. In fact, in the whole criminal history of New York State—and consider the innumerable murders committed by women—only two women have paid the legal penalty, electrocution for murder. Besides the antagonism of many people to capital punishment, in these cases the big factor why most women escape, even if guilty, is the biological element of sex protection instinctively felt by all civilized men toward women. In fact, it is quite true to say that a majority of the public are rarely disappointed or even displeased at the acquittal of a woman charged with murder. Society would better solve the problem if the aim of conviction carried some other penalty than death by hanging or electrocution. For most men feel such punishment is too hideous to inflict on women. Men cannot get away from the life-long conscious or subconscious influences of their own mothers, sisters, wives and daughters. And cold logic has little chance against strong emotional feelings with the average citizen. Even when a woman, indicted for murder, has no personal hold on the public, or even when she has committed a revolting crime, the mere fact of her being a woman is sufficient reason for acquitting, or at least a disagreement.

Since history proves that in the case of women charged with murder, law cannot apply its principles, the rational thing to do would be to change the principles, somehow. For the public, though not averse to the acquittal, are often incensed at the great expense and the folly of the trial.

In fact, the basic fault in this question of insanity and its relation to crime lies in the procedure and not in the practice of a limited number of bad men. It is hard to see how Southard's²⁴ idea that the medico-legal expert—one who accepts law's idea of insanity—be termed an alienist; that the mental disease expert—acting as a

physician only—be termed a psychiatrist, would clear up the present situation.

I think it will be admitted that the average lawyer naturally knows less about psychiatry than the average general practitioner of medicine—not the specialist. And yet practically all the high type general practitioners whom I know will tell you that they know very little about psychiatry—not having given the subject much study since their student days, and rarely treating such cases in private practice. And they will tell you they would not try to prophesy the outcome in such cases. So for this reason, I do not agree with Allan McLane Hamilton who suggested a commission of three to determine the question of sanity—a physician, a lawyer, and a layman. I know where a judge appointed one such commission, and the only physician on it told me he knew nothing of insanity, nor how to proceed to prove or disprove its presence. Why should he be appointed? Why should he want to serve? In a difficult borderline case, a lawyer and a layman having no special technical knowledge of the subject, are chiefly ornamental and not at all useful. Add to this, a doctor appointed because of friendship—who knows nothing about the subject, and the inquiry becomes a farce. A miscarriage of justice might readily ensue. These commissions should be composed only of genuine experts. One expert who has sat on many of these commissions recently told me that he practically never had a man associated with him who knew anything about the subject at all.

Criticisms in Relation to the Jury: On many of the technical questions involved in these cases, it must often be impossible for a lay jury to properly weigh the facts. The result is that not rarely their feelings—or as it is usually referred to—their “good common sense” decides their view. Prejudices easily arise in these cases; and sympathy may outweigh convincing evidence. So we see a clever lawyer strongly appealing to the emotions of a jury. In one case, in which I was interested, one of the lawyers made a wonderfully stirring appeal and practically ignored all of the evidence. He won his case—temporarily only—for the verdict was so outrageously against the evidence (this was a civil case), that the presiding judge set the verdict aside.

Some experts make a bad mistake, when testifying before a jury, in using such technical language, that what they say counts for naught, or may even confuse rather than clarify the issue. Neither by training nor experience are the members of a lay jury skilled in interpreting mental diseases. Simple language should always be used in testifying. Opinions often depend entirely on the point of

view. Often the opinion of even a good psychiatrist expresses only his attitude, particularly when he expresses an opinion based on only a few of the facts in a case.

Experts: Good and Bad: There are all sorts of experts, as there are all sorts of lawyers—both good and bad; both qualified and unqualified. The real expert, besides possessing excellent qualifications, should be honest, frank, unbiased, and courteous; never quick-tempered nor sarcastic, even under an unfair or offensive cross-examination. He should command respect and never invite criticism nor censure.

Two high opinions may be quoted to show that alienists are usually sincere and efficient. Mr. Justice Willard Bartlett, then of the New York Court of Appeals, said that he dissents from the sweeping condemnation of experts, in which some courts often indulge. He said that the medical expert cannot be dispensed with; and he also said we should not libel the most unselfish profession in the world. W. T. Jerome said that in his eight years as district attorney in New York, he could recall only one expert whose testimony was radically dishonest. This view coming from the district attorney is doubly interesting. He says that expert testimony should no more be dispensed with because some alienists lie than the conduct of a case should always be left to the judge because some lawyers coach witnesses to a point amounting to subornation or perjury.

It would be a very excellent practice, if the expert could make a full written report of his findings, state his opinions and the reasons for the opinions, and whether arrived at inductively or deductively. He should state to the best of his ability the diagnosis; the permanency of the condition and whether progressive or not; and his estimation of the accused's personality. In this way we could get a good idea whether the man would be likely to be a menace to society later on. And it would tend to prevent a pseudo-expert who testifies at a trial that the accused was irresponsible because of a "constitutional weakness of the will" from stating a year later that he was "cured" of the "constitutional weakness" and was now normal and safe to be at large!

On such a report he should be cross-examined. This practice is followed in certain European countries, and explains the reason why their experts are held in such high regard. Such a full report would also assist the court in determining whether legal punishment is needed or would be harmful. Not only the individual must be considered, but also the welfare of society.

In the following example, the alienist is correct in his opinion

judged by the legal status—but is not so, from a socio-medical standpoint. The accused, a murderer, had attempted suicide by shooting himself in the head. He developed an amnesia, which covered the period of the crime. Aside from this, the rest of the examination was negative. Gordon²⁵ testified favorably for the defendant, only because the accused was not able to confer with his counsel in preparing his defense on account of the amnesia. Gordon contended that the legal view covers all forms of mental deficiencies, and amnesia is included in the insane category. It was admitted that the accused was legally responsible at the time the murder was committed. Personally, I could not take this position, and I think most psychiatrists would feel the same way. He was not really insane, and certainly did not belong in a hospital for the insane.

The following is a good psychological reason why competent alienists may give an erroneous opinion, in one of these cases, because of faulty judgment. Faulty judgment may be due to one or more of these four factors:

1. Lack of clear ideas because of a superficial examination;
2. Lack of time to fully examine all facts in the case;
3. A hasty appropriation of the judgment of others as one's own;
4. The bias of feeling.

Critics have different ideas as to why capable alienists should give such positively opposite opinions as they sometimes do. If the critic is a doctor he will blame the difference of opinion on faulty study, failure to gather all the facts, and willingness to give a "snap" judgment. If the critic is a lawyer, he will say one of the experts must be wrong, and his error is due to faulty logic. The vulgar criticism is that each expert accepts the attitude of the respective lawyer, and is not a little influenced by the fees involved; basing his deductions on the fact that ordinary murderers do not have an array of experts, and that wealthy men never thought insane before they commit a murder, have no trouble in getting experts to testify to their irresponsibility after the act.

There are different types of the pseudo-expert. There is the man who really knows nothing of mental diseases, but is not willing to admit it. He is very suggestible in the hands of a clever lawyer. There is the professional expert, who hovers about our courts, looking for cases; his interest in hospital and private practice being nil. A man like this usually has a fairly good idea of his subject. His testimony varies according to circumstances. This type is a discredit to the profession; he is the one by means of whom the black-mailing type of lawyer seeks to bolster up a poor case. I have only

seen one of these experts who poses as a mental expert to-day, a surgeon to-morrow, a gynecologist the next day, and so on. The chief stock in trade of such a fraud is an unlimited amount of "nerve" and ready wit. His self-confidence makes up for his other deficiencies. The real expert will always avoid that abomination which has come over from the legal profession—the contingent fee, where the receipt of a fee depends on a successful verdict. This, of course, lays a very strong basis for considering the testimony as being biased.

The physician who appears as an expert witness must not act at the same trial as adviser to counsel, for again this would indicate bias. It would be a good thing, however, if the right of cross-examination were granted the expert for the purpose of upholding the truth of his opinion.

Kelly,¹⁹ previously quoted, gives a lawyer's idea of a medical expert. Among other things, he says the expert should guard against bias, and for this reason should avoid accepting a retainer. He says that courts have ruled that expert testimony is speculative and theoretical, and hence not of much value; that the testimony of a "professional expert" is of doubtful value. He says a doctor may give an opinion as to whether a symptom is feigned, but not as to the motive.

Carlos McDonald suggests that the medical profession should show its disapproval of false experts. This would not deter the ones with no self-respect or self-pride. Nothing but the establishment of some legal qualification could stop them. The qualifications of experts should be better studied and weighed than they usually are at the time of trials. Medical societies have even had tentative laws introduced in state legislatures to control pseudo-experts. The laws failed to pass on the grounds that they were unconstitutional. And again, according to Ransom,²⁶ an official medical commission in New York State recommended certain requirements for experts. These were killed in the judiciary committee of the legislature.

The Hypothetical Question: I will briefly discuss the hypothetical question and writs of habeas corpus. It is almost universally agreed among medical men that the hypothetical question should be abolished. It is often very long and confusing and may take hours to read. In fact, in one case in which I was an expert witness, the question asked the opposing expert took one and a half days to read. As a rule, each side discreetly omits important facts in the question so that, as one critic says, the doctor becomes the tool of the attorney. Frequently the jury cannot follow the question, and so disregards the answer of the expert altogether. In many cases the expert cannot give a simple

"yes" or "no" to the question—containing as it does much irrelevant and useless material—at least from the medical point of view. The important details are so disconnected that they lose their value. "Assuming so and so to be true" is frequently heard—when as a matter of fact, testimony on the opposite side may be quite to the contrary. The opposing expert is asked to assume that something else is true. It would be much better if the same question were asked the two sets of experts. At least, they could then debate on common ground. The public, always wondering why experts differ so radically in the same case, do not take into consideration that they are asked to give opinions on unlike situations—each picture being drawn up by the opposing lawyers. In civil cases, there is another element of confusion between experts. After the main question is asked, they are asked as to whether the condition is permanent or not. The facts presented are frequently insufficient to give an opinion pro or con. In criminal cases, where insanity is the issue, the question of permanency comes up. If insane, the defense always wants a curable form, the prosecution an incurable one—as though in reality—in private practice, such were the rule; which, of course, it is not.

How much more satisfying it would be, if the expert after listening to all the evidence, was merely asked his opinion and the reasons why he formed that opinion. A long question is apt to lull the jury to sleep, particularly as they almost know what the answer will be. The only real valuable information is often brought out not on the direct, but on the cross-examination. Some day, let us hope the hypothetical question as at present employed, will be dispensed with.

Writs of Habeas Corpus: Writs of habeas corpus should be granted in the case of insane convicts only when medical evidence shows that they are warranted. Otherwise a rich and socially influential criminal could by means of countless unnecessary writs spend a large part of his time traveling all over the state to appear in various courts. A large percentage of the insane have no insight (no realization) of their condition. This is especially true of the paranoid types, who often show little or no deterioration. They can even deceive an honest lawyer, who must be on his guard when dealing with such individuals. There are certain young attorneys who are not averse to taking these cases, inasmuch as being connected with such an "important case" can help to take him out of obscurity.

An interesting review of requests for discharges from criminal insane asylums on writs is given by Doctor Lamb, then of the Matteawan State Hospital for the Criminal Insane in New York

State. The review covers forty-one cases. Seven of these were remanded back to the hospital. Of the thirty-four discharged from the hospital, fourteen found their way back to prison or some hospital; eight were troublesome to their families because of mental disturbances; three could not earn their living and had to be cared for by relatives; six disappeared; two committed suicide; and one was partially self-supporting. The result is significant, and needs no comment.

Changes Needed: General Remarks: There is no doubt but that changes are needed in the management of these cases. One wonders if the two parent societies—the American Bar Association and the American Psychiatric Association could not jointly lend their influence to lessen present evils. Other legal and medical societies would help also. Mere criticism of law by the doctor and vice versa will lead to nowhere. I am sure it will be admitted that far more criminals are turned back on society by their evading punishment by means of legal technicalities, than by means of testimony given by pseudo-medical experts. In either case, public opinion is outraged. And where principles of justice cannot be applied in these cases, the money spent and wasted is to no avail. If hospital observation could only be ordered in all of these cases the individual would get justice, and society better protection. No reforms can be instituted without the strong support of the legal profession. Without this support, any discussion on this subject must be purely academic.

The doctrine of partial, limited, or lessened responsibility should be written into the law and not be left to inference. Certain European countries have a penal code which recognizes partial responsibility. Any basic defects in the law concerning the procedure in these cases should be corrected.

The medical profession has recommended that medical examining boards pass on and qualify experts. Thus lawyers could select real experts, and judges could select commissions from such qualified men. Such men would be less apt to be deceived by the relatives of the accused, who, as one Supreme Court justice remarked, "They lie at the time of the trial for murder, so that their relative will escape the penalty of the law. Later, at a hearing in answer to a writ of habeas corpus, they lie to get the patient discharged from the hospital as 'cured,' saying that their original statements were mistakes, etc."

McDonald said that we could depend on experts appointed by the court as being men of skill and repute. This may be true of most judges, but not of all; for judges have on occasions unwittingly appointed unfit men to act as experts. Dercum objected to the last

suggestion, saying that politics would enter into the appointment of experts, and opposed standardization of experts on the ground that experts could not be made in college. But if a man had made good use of his opportunities and benefited by his experience, there could be no objection to his being standardized. And as for the danger of politics entering into the selection, it could exist whether the standard was high or low, but with a proper standard a qualified man would be chosen anyway.

Justice Bartlett claims that you cannot restrict individuals to only official experts; that the Bar would not approve of creating a privileged class of expert witnesses. The medical man, of course, feels that to thus qualify efficient experts would not be creating a privileged class; and he feels that this attitude of law favors the development of the pseudo-expert. So many of the recommendations made by medical men are met with the objection that they are unconstitutional. Constitutional rights of the individual ought not to be in disharmony with the needs of society. It was once unconstitutional for women to vote, but it is so no longer. The object of law is to protect society. Judge Bartlett said it would be best for the court to appoint experts, who would have access to all the evidence, and who would submit a written report to the court. This would be a satisfactory method. It is a constitutional right of the defendant to call other witnesses, if so desired. As a rule the opinion of the court's experts would have greater weight. But just because of this, opposition arose to the idea. The legislatures of two states held opposite views on this matter. It is valid in Rhode Island and invalid in Michigan, according to Bristow.²⁷ It would be well if the sanity or insanity of the accused could be properly determined before a trial, by experts appointed by the court. The jury could establish the commission of the crime on the merits of the case. If guilty, he would be sent to prison; if insane, to a hospital. In this way society would be protected.

In England, even if the accused pleads insanity, his technical guilt is first established, and then the Home Secretary sends an expert to examine him as to the condition of insanity. In France and Germany a commission settles the question of insanity, making a purely medical diagnosis.

The most important point to decide is whether the individual is fit to live in society or is dangerous to be at large. His crime opposes society, and society has a right to protect itself. Legal procedure is keen on technicalities, but the spirit of Medicine is not in favor of them. To correct the present chaos individuals can do little, but

organizations might do much to interest our legislatures. Public interest must be aroused. The aid of practical sociologists—not the silly, sentimental type—would be valuable.

Crime and Punishment: Short sentences are useless for old habitual offenders. Many of them should be taken out of society for life. Those of this type who are mental defectives can only lead a socially profitable life under supervision in an institution.

The cost of many a big trial would be enough to feed the inmates of a big hospital for almost a year. And yet the murderer may be acquitted on a technicality, or a disagreement may result. If acquitted, the murderer is often treated as a hero by a certain emotional set. What would happen if the city tried to spend a fraction of the cost of some of these trials to save the life of a decent man? It might not be amiss to mention here that it would be a good thing if law students were given a few lectures on the elements of insanity as it is related to the practice of criminal law.

Long delays between the commission of crimes and trials are bad. For punishment under any conditions must be immediate to be effective. And it should not be only for retaliation, but to protect society, and to cure the individual, if possible, by mental, educational, and vocational means. A psychopathologist, attached to every big prison, could give valuable aid. Healy⁸ shows the good results obtained in many of these cases. Human abilities and needs are variable. To condone a single offense in an individual of good character may save a man to society. For the idea, "once a criminal, always a criminal," is a false axiom.

A very big factor in disagreements in trials for murder lies in the opposition, conscious or subconscious, of many men to the death penalty. A juror's feelings in this respect may overcome his judgment and his sworn duty to abide by the evidence. This is particularly true where women are the defendants. Any loophole—even a doubtful insanity—is welcomed as an excuse or rationalization for their erroneous opinion. If life imprisonment, instead of execution by electricity or hanging, was the ultimate penalty, very likely more dangerous criminals would be found guilty. And again, under such circumstances, if a juror feared he might be making a mistake, this latter sentence would permit amends being made later. During the course of a long trial all sorts of doubts and associations flit through the mind of the honest and conscientious juror. And some of these associations have greater determining value in forming his opinion than most of the evidence.

One writer on medical jurisprudence, who in his studies paid

more attention to the criminal than to the crime, said that it was a strange thing that in many instances the one alternative to the electric chair was an acquittal. And this in spite of the fact that the accused was of the type who was unsafe to be at large.

Some of the individuals we are discussing belong in hospitals or colonies. It is hard to awaken the public to the fact that if many defectives—not all—were segregated in colonies for life much crime could be prevented. The public wait, before acting, till some overt act is committed with serious consequences to some one. We know that by no means all the insane and mental defectives are in our hospitals. A defective, unable to adjust to the complexities of city life, may not only be happy but partially self-supporting in a well-regulated colony. We have too few of these colonies. You could not get antisocial types to go to any institution voluntarily.

The public know too little of the excellent care given the psychotic in our state hospitals. They are fully equipped for the cure of recoverable cases. The incurable custodial patients receive every attention possible, many of them being better cared for than they were in their own homes. The disrepute that these institutions are held in by a few people is due to the unjust and sensational articles which appear at irregular intervals in certain newspapers. Those of us who have served on the staffs of these hospitals know their real value. Most of our judges realize the truth of the above statements. Now and then, however, we hear of a judge who confounds the criminal insane with the civil insane. And I heard one judge once refer to a patient going to one of these "prisons," quickly correcting to "one of these hospitals."

The commitment of a civil psychotic patient should not be regulated by the procedure followed in criminal cases. It is not in most places. Yet Fenning,²⁸ a Washington attorney, says that the procedure for committing a civil case in the District of Columbia is cruel. Relatives of insane criminals can rest assured that the hospitals for the criminal insane are real hospitals and not merely prisons.

And most of our state prisons to-day are also conducted along scientific lines. So in a case of doubt as to which institution an individual belongs in, as long as society is protected and the individual well cared for, no apprehension on the part of the public need be felt. If examination in prison shows a prisoner to be insane, he is transferred to a state hospital for the criminal insane. In both places marked physical disorders are corrected. However, this alone will only infrequently cure insanity; the cure of life-long faulty mental habits takes a long time; and often they cannot be cured in

elderly adults. There is much good psychiatric and social work done in our prisons to-day. This sort of effort is more valuable than much of the sentimental nonsense of certain "prison reformers." An important object of the prison should be to make real men out of as many of the inmates as possible by developing in them good character traits. They must learn to know themselves and their weaknesses; the wish to be socially esteemed must be instilled in them. They must be taught to be productive. Certain criminals with marked psychopathic traits might be moderately comfortable in a prison but would react badly in a hospital for the criminal insane where they may not belong. Psychopathic traits are found in all criminals.

In closing let me reiterate that one of the most valuable changes that ought to be written into the Law is the doctrine of partial responsibility. Members of the legal profession are the ones who could most expeditiously do this. For after all, crime is primarily a legal (sociological) problem. The function of Medicine in these cases is only to interpret mental phenomena and to act in an advisory capacity to Law.

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ON THE BRAIN OF DEMENTIA PRECOX

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INTRODUCTION

Dementia precox is one of the most obscure diseases in psychiatry. We are still in utter darkness as to the exact cause, pathology and treatment. Kraepelin states that this disease is prevalent among youths and found everywhere in the world, that there is some hereditary taint in its appearance, and that there are various symptoms which point to autointoxication resulting from abnormal metabolism. As for the exact cause of the disease, however, he gives nothing definite. Pathologically the author claims to be able to find diffuse alteration in the cerebral cortex, while by macroscopical examination edema and congestion of the pia mater are often to be noted. By the help of valuable researches accomplished by workers such as Alzheimer, Nissl, Wada, Sioli, Moriyasu, Goldstein and Mondio he tried to establish a hypothesis as to the relation existing between workers' findings and clinical symptoms of this disease. The theory of the internal secretory failure or of autointoxication may give one no small interest so far as it is treated as a mere hypothesis; but as an established fact, as Kraepelin states, it lacks reliable support. From the therapeutic standpoint one may imagine how little we can succeed without knowing the true character of this disease, therefore it is our desire to find out something worth while to add to the knowledge of this disease.

The study consists in serology, pathology, experimental treatments and clinical observations. The first report concerns the macroscopical anatomy of the brain of dementia precox cases. Not much importance has ever been attached to this kind of study and very little could be obtained from the literature. This point alone may, therefore, justify the significance of the present work.

OBSERVATION AND COMMENT

In this study we have adopted Kraepelin's new classification of dementia precox, only excluding what he calls paraphrenia. We ourselves again subdivide it into three types: hebephrenic, catatonic

and paranoid dementia precox. The distinction of the types is found occasionally to be uncertain and obscure and therefore not much importance has been attached to it. The material has been derived from the brains, 106 in all, of the dementia precox, obtained from the autopsy in the course of eleven years (1909-1919) at the psychiatric research laboratory of the Tokyo Imperial University.

The column of "mental state" in Table 1 points out the mental decline previous to death. The progress of mental decline being very slow the grades might have been more finely differentiated had we not feared falling into useless intricacy. The reporters are, therefore, content with adopting the simplest possible method of classification, *i.e.*, three large stages:

1. Nondementia.
2. Terminal dementia.
3. Slight dementia, in which the mental state is found midway between 1 and 2.

As for the brain weight we have adopted the one which was taken at the autopsy table. The weight includes pia mater and excludes the liquid lost in the course of operation. In the weight of rhombencephalon a part of the spinal cord is included, being unable to make an exact section between medulla and cord. Brains having antiseptic measure by injection of formalin are omitted from this study, because such are found more or less different from the standard.

The column "other observations" presents data indispensable for the present report. Edema, turbidity, and venal congestion of pia mater are especially considered in the histological section of this study, for we are rather of the opinion that these alterations had been produced mostly on the verge of death, so have little significance with the present subject.

The "remarks" column treats only of such points as are of immediate necessity to this study.

Age at death: Among 103 cases (in three cases the age is unknown) the youngest is twenty years of age (a single case), the oldest, sixty-five years (a single case), and the average, 40.7 (*cf.* Table 2).

TABLE 2. AGE AT DEATH

Under 30 years.....	28 cases	27%
Under 40 years.....	29 cases	28%
Under 50 years.....	17 cases	16%
Under 60 years.....	21 cases	20%
Under 70 years.....	8 cases	7%

TABLE 1

A—Pulmonary Tuberculosis.
 B—Emaciation.
 C—Stomach Catarrh.
 D—Heart Disease.
 E—Beriberi.
 F—Nephritis.

G—Pneumonia.
 H—Dysentery.
 I—Pleuritis.
 J—Meningitis.
 K—Peritonitis.

No.	Name	Age	Diagnosis	Duration of Suffering	Mentation	Cause of Death	Total Weight of Brain	Cerebrum
1	Ikeda	♂ 27	Katatonia	11	Terminal	A	1230	1030
2	Yukikawa	♂ 27	"	9	"	A	1281	1085
3	Abe	♂ 58	"	21	"	B	1320	1075
4	Yamaguchi	♂ 37	"	14	"	A	1370	1133
5	Nozaki	♂ 42	"	22	"	A	1360	1158
6	Konishi	♂ 43	"	14	"	C	1270	1094
7	Isobe	♂ 47	"	22	"	D	1210	1040
8	Kamata	♂ 36	"	11	"	A	1240	960
9	Hirabayashi	♂ 37	"	16	"	E	1103	920
10	Kusakabe	♂ 34	"	19	"	E	1300	1190
11	Yanagi	♂ 35	"	11	"	E	1230	1060
12	Kitayama	♂ 27	"	8	"	E	1320	1133
13	Shimizu	♂ 29	"	7	Slight	A	1288	1112
14	Ashitani	♂ 27	"	11	"	A	1210	1046
15	Fukuta	♂ 49	"	25	"	F	1190	1020
16	Kashiwagi	♂ 36	"	10	"	A	1300	1218
17	Katayama	♂ 28	"	12	"	A	1350	1140
18	Ikeda	♂ 26	"	5	"	D	1220	1040
19	Fukano	♂ 38	"	19	"	A	1420	1204
20	Horii	♂ 32	"	11	"	G	1450	1222
21	Suyama	♂ 27	"	6	"	A	1310	?
22	Hidome	♂ 48	"	26	"	G	1460	?
23	Morikawa	♂ 52	"	15	"	A	1434	1245
24	Fujii	♂ 26	"	4	"	A	1378	1161
25	Honda	♂ 25	"	8	"	A	1270	1060
26	Shibayama	♂ 34	"	11	"	H	1360	1160
27	Komatsu	♂ 25	"	3	"	I	1334	1136
28	Kikawa	♂ 38	"	3	"	K	1320	939
29	Suzuki	♂ 24	"	7	"	G	1490	1272
30	Hashimoto	♂ 39	"	2	"	J	1420	1250
31	Imai	♂ 20	"	1	Latent	A	1600	1570
32	Matsuzawa	♂ 26	"	7	Slight	K	?	?
33	Ishiwata	♂ 38	"	14	Terminal	B	?	?
34	Tomizuka	♂ 60	"	46	"	L	1524	1268
35	Hase	♂ 35	"	9	"	E	?	?
36	Fukano	♂ 44	"	18	"	L	1539	1324
37	Toshima	♂ 30	"	7	"	A	?	?
38	Hashimoto	♂ 33	"	12	"	B	?	?
39	Nakanishi	♂ 31	Hebephrenia	13	Slight	M	1280	1090
40	Suzuki	♂ 43	"	7	"	D	1350	1180
41	Shibuya	♂ 21	"	8	Terminal	A	1370	1170
42	Fukuji	♂ 45	"	21	"	A	1450	895
43	Endo	♂ 31	"	2	Slight	A	1277	1088
44	Kohata	♂ 22	"	2	"	A	1345	1180
45	Taketa	♂ 37	"	9	"	?	?	?
46	Miyajima	♂ 55	Dementia	9	"	E	1500	1357
47	Nakatani	♂ 37	paranoides	6	Latent	A	1222	1050
48	Otake	♂ 23	"	5	"	B	1337	1149
49	Miyazaki	♂ 36	"	2	"	F	1420	1280

TABLE 1

L—Cerebral hemorrhage.
M—Hepatosclerosis.
N—Asthma.
O—Uremia.
P—Collapse

Q—Stomach Ulcer.
R—Hemophilia.
S—Angina Pectoris.
T—Stomach Cancer.
U—Intestinal Tuberculosis.

Left Hemisphere	Right Hemisphere	Rhomb-Encephalon	Atrophy of Gyrus	Other Observations	Remark
520	510	180	O	Simple and diffused gyrus of cerebrum. Hydrocephalus. (More on left.)	Facial asymmetry.
543	542	184	?		
530	545	150	F, O		
565	568	162	?	Adhesion of dura mater and cranium asymmetry of skull.	
583	575	171	F, P		
548	546	166	F, C, P, T		
540	500	170	F	Asymmetry of skull.	Born dull; circumference of head: 53 cm.
480	480	165	F, P, C		
351	572	180	F, P, T	Hydrocephalus (on left).	Born in 8th month. Born dull.
540	550	201	?		
600	600	162	?		
573	560	186	F, P		
558	554	172	F, P		
522	524	164	?		
530	510	156	?	Hypertrophy of pia mater cicatricial atrophy on P	Born stupid; circumference of head: 53.5
588	630	?	F, P		
570	570	200	F		
520	520	170	F, T, O		
600	604	192	F, T		
616	606	148	F, P		
?	?	?	F		
?	?	?	P		
620	625	174	F, P		
595	591	208	F		
532	530	170	F, P, T		
580	580	165	O	Hydrocephalus	
562	574	186	F, P, T	Asymmetry of skull; diffused gyrus of cerebrum.	Born dull.
468	471	172	F, P, T		
646	626	176	F, P		
630	620	152	O		
750	760	165	E (slight)	Tiny gyrus on left P, asymmetry of skull.	
?	?	?	F, T		
?	?	?	F, P	Old internal pachymeningitis	
634	634	210	?		
?	?	?	F, P	Hypertrophy of pia mater pigmentation; diffused gyrus of cerebrum.	Circumference of head: 52 cm.
742	582	182	F		
?	?	?	F, P		
?	?	?	F, P, T	Hypertrophy of pia mater.	Dull after injury on head.
560	550	190	F	Asymmetry of skull.	Born dull; circumference of head: 50.1 cm.
590	590	170	?		
590	580	180	F, P	Hypertrophy of pia mater hydrocephalus.	Born dull; cross-eyed; turbidity of right cornea.
446	449	144	F	Hypertrophy of pia mater diffused gyrus frontalis	Born dull; circumference of head: 51 cm.
550	558	180	?		
590	590	165	F		
?	?	?	F		
680	677	167	P		
520	531	170	O	Hypertrophy of cranium; degeneration of lateval spinal cord.	Born dull; circumference of head: 57.5 cm.
580	569	195	F, P, O		
670	630	220	O		

TABLE 1—Continued

No.	Name	Age	Diagnosis	Duration of Suffering	Mentation	Cause of Death	Total Weight of Brain	Cere- brum
50	Iwata	♀ 33	Katatonica	12	Terminal	A	1025	860
51	Soda	♀ ?	Katatonica	?	Terminal	A	1100	918
52	Hirata	♀ 41	"	13	"	A	1200	1035
53	Funaki	♀ 37	"	13	"	D	1180	997
54	Yamada	♀ 24	"	9	"	F	1300	1128
55	Yamaoka	♀ 57	"	37	"	A	1032	859
56	Watanabe	♀ 49	"	27	"	A	1200	1035
57	Saito	♀ 62	"	33	"	N	1250	1064
58	Ono	♀ 59	"	?	"	A	1140	982
59	Ushizawa	♀ 38	"	8	"	F	1070	800
60	Akiyama	♀ 48	"	10	"	T	1160	990
61	Ohashi	♀ 49	"	7	"	C	1223	1056
62	Kaida	♀ 48	"	24	Slight Terminal	E	1242	1072
63	Suto	♀ 55	"	21	"	A	1170	?
64	Osada	♀ 44	"	23	"	A	1150	979
65	Motoda	♀ 53	"	23	"	A	1113	970
66	Kondo	♀ 28	"	6	Slight	A	1250	?
67	Sano	♀ 34	"	10	Terminal	A	1140	?
68	Omura	♀ 55	"	27	"	B	1090	940
69	Noguchi	♀ 54	"	21	"	A	1180	1000
70	Nakamura	♀ 64	"	25	"	D	1260	1100
71	Shirosaka	♀ 38	"	21	"	E	1246	1076
72	Ide	♀ 29	"	5	Slight	I	1200	1018
73	Ozuka	♀ 32	"	7	Terminal	J	1170	1004
74	Hiramitsu	♀ 57	"	6	Slight	B	1097	942
75	Kojima	♀ 36	"	7	Terminal	A	1200	1046
76	Fujita	♀ 29	"	8	Slight	A	1210	1069
77	Sakaki	♀ 51	"	12	Terminal	G	?	?
78	Takamiya	♀ 30	"	4	Latent	A	1184	1010
79	Kasue	♀ 22	"	3	"	A	1210	1041
80	Ashiya	♀ 61	"	1	"	B	1160	1012
81	Fujii	♀ 28	"	1	"	F	1194	?
82	Yoshida	♀ 63	"	?	Terminal	O	?	?
83	Hayachi	♀ 37	"	2	Latent	P	?	?
84	Okabe	♀ 53	Hebephrenia	12	Terminal	E	1280	1110
85	Kakegawa	♀ ?	"	?	"	U	1140	972
86	Hirano	♀ 34	"	12	"	A	1030	840
87	Nakamura	♀ 53	"	22	"	A	1170	1040
88	Suzuki	♀ 65	"	31	"	E	1168	1012
89	Takamatsu	♀ 51	"	15	"	E	1155	1018
90	Suzuki	♀ 26	"	7	Slight	A	1290	1090
91	Saito	♀ 41	"	9	Terminal	K	1193	1021
92	Tajima	♀ 55	"	24	"	Q	?	?
93	Tanaka	♀ 27	"	12	"	R	?	?
94	Hosii	♀ 26	"	5	Slight	A	1030	895
95	Kunii	♀ 54	"	7	"	S	?	?
96	Nojiri	♀ 64	"	16	Terminal	B	1154	?
97	Sawamura	♀ 55	Dem. Paranoides	18	Latent	D	1112	970
98	Naito	♀ 59	"	16	Slight	I	1252	1016
99	Hasegawa	♀ 43	"	8	Terminal	F	1030	883
100	Ito	♀ 55	"	3	Latent	O	1280	1050
101	Hashimoto	♀ 51	"	8	Slight	E	?	?
102	Yamaguchi	♀ ?	"	?	"	?	?	?
103	Hata	♀ 40	"	7	"	F	?	?
104	Katsuya	♀ 64	"	?	"	B	?	?
105	Tamiai	♀ 41	"	7	"	G	?	?
106	Nakazawa	♀ 65	"	23	"	G	?	?

TABLE 1—Continued

Left Hemisphere	Right Hemisphere	Rhomb-Encephalon	Atrophy of Gyrus	Other Observations	Remark
430	430	123	F, P, T	Hypertrophy of dura mater; asymmetry of skull.	Meningitis after injury at age 2. Unwholesome mental growth since then. Circumference of skull: 48.5 cm.
460	458	104	P		
515	520	275	F, P		
498	499	145	P		
564	564	172	O		
435	424	147	F, P, T	Diffused gyrus frontalis; old internal pachymeningitis.	
514	521	175	F, C, P, T		
547	517	165	?		
499	483	151	F, P, T		
450	440	170	?		
500	490	150	F	Hypertrophy of cranium	History missing.
530	526	161	F, C, P, T	Hypertrophy of cranium.	Born dull.
530	542	138	F, P	Hydrocephalus.	Born stupid; left half of face smaller.
?	?	?	F		
486	493	152	F, C, P	Hydrocephalus	Asymmetry of upper jaw.
486	484	168	F, P		
?	?	?	?		
?	?	?	F, P		
470	470	145	F, P, T	Simple and diffused gyrus.	
500	500	150	F, T	Hypertrophy of cranium; hydrocephalus internus.	Born dull.
550	550	175	F, P, T		
546	530	108	F, P		
520	518	162	?		
505	496	162	?		
469	473	155	F, P	Hypertrophy of pia mater.	Spasmodic fits in childhood.
523	523	158	?		
530	539	155	?		
?	?	?	F, C, P, T, O	Diffused gyrus hypertrophy of skull.	Born quite dull.
505	505	150	F, P	Hypertrophy of skull.	
520	520	145	C, P		
508	504	144	F, C, P, T	Adhesion of dura mater and cranium.	Born quite dull.
?	?	?	F	Old internal pachymeningitis.	Head bruised on fall in childhood.
?	?	?	F, C, P, T		
?	?	?	O		
570	560	220	F, P, T		
482	490	167	F, C, P	Old internal pachymeningitis.	
420	420	142	F, P	Hypertrophy of pia mater.	Born quite dull.
540	500	166	F, P, T	Diffused gyrus frontalis.	Spasmodic fits up to 3.
505	505	138	F, C, P, T		
510	508	137	P		
540	550	163	F, P	Hydrocephalus.	Head bruised at 6; circumference: 56.5 cm.
571	599	155	P		
?	?	?	?	Diffused gyrus frontalis ossification into dura mater.	
?	?	?	F, C, P, T, O		
450	445	152	F, P	Asymmetry of skull.	Born dull.
?	?	?	F, C, P, T, O		
490	492	152	F, P, T	Hydrocephalus, syringomyelia.	
485	485	145	O		
510	506	142	?	Diffused gyrus frontalis.	Born dull.
?	?	149	?		
?	?	140	O		
?	?	?	F, P		
?	?	?	F, P		
?	?	?	P		
?	?	?	F, P		
?	?	?	F, T		
?	?	?	F	Makrogyria frontalis.	"Fowl" head.

The death rate is highest at the third and fourth decade followed by that of fifth, sixth and seventh by degree. Few are found to be living above the age of sixty.

The duration of the disease: The number of years from onset till death as observed in 100 cases (6 cases unknown) varies from the minimum of one year to the maximum of forty-six years, the average being 12.5 years (*cf.* Table 3).

TABLE 3. DURATION OF THE DISEASE

Under 5 years.....	20 cases	20%
Under 15 years.....	52 cases	52%
Under 25 years.....	21 cases	21%
Under 35 years.....	5 cases	5%
Under 50 years.....	2 cases	2%

As is shown in Table 3, the death rate stands highest at the duration from five years to fifteen years. It must be mentioned, however, that Table 3 would show only approximate data, for in a disease like dementia precox one often fails to obtain an exact time of onset.

Cause of death: The cause of death is the one determined from both clinical symptoms and autopsical findings.

TABLE 4. CAUSE OF DEATH

Tuberculosis.....	48 cases	45.3%
Beriberi.....	12 cases	11.5%
Nephritis.....	9 cases	8.5%
Emaciation.....	8 cases	7.5%
Pneumonia.....	7 cases	6.6%
Heart disease.....	6 cases	5.6%
Tubercular meningitis.....	2 cases	1.8%
Cerebral hemorrhage.....	2 cases	1.8%
and others.....	1 case	0.9%
Unknown.....	2 cases	1.8%

Approximately one-half of this series died of tuberculosis (pulmonary tuberculosis, intestinal tuberculosis, pleuritis, peritonitis) next coming beriberi, nephritis, constitutional emaciation, by order. These seem to be the diseases which overcome chronic invalids like dementia precox. In the "and others" column in Table 4, asthma, gastric cancer, gastric catarrh, dysentery, cirrhosis of the liver, collapse, hemophilia and angina pectoris are included.

The total weight of the brain: In 41 male cases (cases 34 and 36 excluded, which died of cerebral hemorrhage) the maximum is found to be 1.600 grams, the minimum, 1.054 grams, and the average 1.322 grams. In 45 female cases, the maximum, 1.300 grams, the minimum, 1.025 grams; and the average, 1.170 grams.

The average brain weight of Japanese has been investigated by Professor Taguchi (first and second report), Professor Hara, Dr.

Kurokawa, Dr. Denyz and Professor Suzuki. Comparing brain weights of our dementia precox cases with those of the last three authors (the first two are less reliable because of the small number of cases studied) a table is made as follows:

TABLE 5-A

	Dementia Report 1		Report 2	Hara	Hara	
♂	Precox	by Taguchi	by Taguchi	(criminals)	(Patients in his wards)	Kurokawa
	41 cases	100 cases	374 cases	350 cases	19 cases	
	gms.	gms.	gms.	gms.	gms.	gms.
Max. weight	1600	1790(-190)	1790(-190)	1650(-50)	1690(-90)	.....
Min. weight	1054	1140(-86)	1063(-9)	1200(-146)	1070(-16)	.....
Ave. weight	1322	1356(-34)	1367(-45)	1384(-62)	1382(-60)	1401(-79)

TABLE 5-B

	Dementia	Report 2 by	Hara (Patients	
♀	Precox	Taguchi	in his wards)	Kurokawa
	45 cases	150 cases	4 cases	
	gms.	gms.	gms.	gms.
Max. weight.....	1300	1432(-132)	1345(-45)	.....
Min. weight.....	1025	961(-64)	1120(-95)	.....
Average.....	1170	1214(-44)	1248(-78)	1255(-85)

Thus in the male cases the maximal brain weight of dementia precox is 50 to 190 grams less than that of ordinary male Japanese; while the minimum 9 to 140 and the average 34 to 79 grams less than that of the respective ordinary cases. In the female the maximum weighs 45 to 132 grams less than that of the ordinary female; the minimum 64 grams more than that given by Taguchi, and 65 grams less than that of Hara; the average, 44 to 85 grams less than that of the normal.

Thus it will be noticed that the brains of dementia precox show, in general, a remarkable decrease in weight. The fact that the minimum weight of the female brains is 64 grams more than that of Taguchi would be readily understood when one comes to know that in this author's cases a case of idiocy, a case of mental disease, and 32 unidentified cases are included. Table 6 is arranged after Schwalbe's system, comparing brain weights of our cases with those of Taguchi's.

TABLE 6

Schwalbe's Table of Brain- weight	Taguchi ♂		Dementia ♂		Taguchi ♀		Dementia ♀	
	Precox		Precox		Precox		Precox	
	374 cases	Per cent	41 cases	Per cent	150 cases	Per cent	45 cases	Per cent
960-1020	0	0	0	0	3	2.0	0	0
1020-1050	0	0	0	0	3	2.0	5	11.3
1050-1075	1	0.2	1	2.4	6	4.1	1	2.2
1075-1100	2	0.5	0	0	8	5.3	2	4.5
1100-1130	2	0.5	1	2.4	12	8.0	3	6.8
1130-1160	6	1.6	0	0	14	9.3	7	15.5

TABLE 6—Continued.

Schwalbe's Table of Brain- weight	Taguchi ♂		Dementia ♂ Precox		Taguchi ♀		Dementia ♀ Precox	
	374	Per	41	Per	150	Per	45	Per
	cases	cent	cases	cent	cases	cent	cases	cent
1160-1190	5	1.3	1	2.4	12	8.0	8	18.1
1190-1220	12	2.6	3	7.3	24	16.0	8	18.1
1220-1250	20	5.3	4	9.7	28	18.6	5	11.3
1250-1275	25	6.6	3	7.3	15	10.0	2	4.5
1275-1300	34	9.0	5	12.1	9	6.0	4	9.0
1300-1330	39	10.4	4	9.7	6	4.1	0	0
1330-1360	37	6.8	7	17.0	3	2.0	0	0
1360-1390	36	9.6	3	7.3	2	1.3	0	0
1390-1420	33	8.8	3	7.3	4	2.6	0	0
1420-1450	33	8.8	2	4.8	1	0.6	0	0
1450-1475	31	8.2	1	2.4	0	0	0	0
1475-1500	16	4.2	2	4.8	0	0	0	0
1500-1530	15	4.0	0	0	0	0	0	0
1530-1560	12	3.2	0	0	0	0	0	0
1560-1590	4	1.0	0	0	0	0	0	0
1590-1615	4	1.0	1	2.4	0	0	0	0
1615-1645	5	1.3	0	0	0	0	0	0
1645-1670	0	0	0	0	0	0	0	0
1670-1700	1	0.2	0	0	0	0	0	0
1700-1735	1	0.2	0	0	0	0	0	0
1735-1760	1	0.2	0	0	0	0	0	0
1760-1785	0	0	0	0	0	0	0	0
1785-1810	1	0.2	0	0	0	0	0	0

The same is arranged into three different sections (Table 7); first, brains under 1300 grams; second, under 1500 grams; third, over 1500 grams.

TABLE 7-A

Male ♂	Taguchi	Dementia Precox
Under 1300	28 %	43.9%
1300-1500	60.1%	53.6%
Above 1500	11.7%	2.4%

TABLE 7-B

Female ♀	Taguchi	Dementia Precox
Under 1300	89.3%	100%
1300-1500	10.6%	0
Above 1500	0	0

This leads us to the conclusion that the male brains weighing more than 1,300 grams are found in a greater number among the sane and those weighing less than 1,300 grams much more in dementia precox. Of the Japanese female 10.6 per cent is above 1,300 grams while none of our patients' weighs over 1,300 grams. The last table will justify the belief that the brains of dementia precox weigh less than those of the normal person.

The next analogical observation is made of the comparison of brain weights of dementia precox with those of general paralysis

and idiocy which show mental decay to the same extent as dementia precox. We are already in possession of a like report made by Drs. Miyake and Kurosawa (1908), on the brain weights of general paralysis produced from this laboratory. According to this the average brain weight of 37 male cases is 1.295 grams and that of 12 female cases, 1.194 grams. Table 8 presents the statistics of the brain weights of the idiots (prepared by the reporters), those under seventeen years of age being purposely excluded to make it available in our comparative study.

TABLE 8-A. TOTAL BRAIN WEIGHTS OF MALE IDIOTS

No.	Name		Age	Total Weight	Left Hemisphere	Right Hemisphere	Rhomben-cephalon
1	Ikeda	♂	37	1207	525	525	146
2	Kitagawa	♂	21	1300	560	560	161
3	Sunagawa	♂	27	1310	483	583	100
4	Koyama	♂	24	1292	576	576	188
5	Nakamura	♂	20	1246	554	554	142
6	Takita	♂	21	1065	398	388	141
7	Tani	♂	32	1290	540	540	203
8	Shimada	♂	21	1290	540	540	203
	Average			1294			

TABLE 8-B. TOTAL BRAIN WEIGHTS OF FEMALE IDIOTS

No.	Name		Age	Total Weight	Left Hemisphere	Right Hemisphere	Rhomben-cephalon
9	Takekawa	♀	43	1140	560	470	160
10	Wakabayashi	♀	44	1140	502	484	140
11	Matsushima	♀	33	1000	480	480	136
12	Chimura	♀	40	1200	522	522	144
13	Yoneta	♀	18	1086	450	450	140
	Average			1133			

Thus the average brain weight of 8 male cases of idiocy is 1.294 grams, whereas that of 5 female is 1.133 grams.

Table 9 presents the average weights of the brain in cases of dementia precox, general paralysis and idiocy.

TABLE 9. COMPARISON BETWEEN AVERAGE BRAIN WEIGHTS

Dementia Precox		Dementia Paralytica	Idiocy
♂	1322	1296 (+29)	1294 (+28)
♀	1170	1194 (-24)	1133 (+37)

In the cases of dementia precox the brain of the male average weighs 29 grams more than that of general paralysis and 28 grams more than that of idiocy; the female average is 24 grams less than that of general paralysis and 37 grams more than that of idiocy. It will be noticed that the brains of dementia precox give only 30

grams or so of disparity in average weight as compared with those of idiocy or of general paralysis.

The weight of cerebrum (hemispheres) in 39 male and 40 female dementia precox cases is given in Table 10.

TABLE 10. WEIGHT OF CEREBRUM

Maximum	Minimum	Total
♂ 1510	895	1142
♀ 1128	840	1000

As for the rhombencephalon, in 38 male cases, the maximum amounts to 208 grams; the minimum, 144 grams; the average, 174 grams; in 41 female cases, the maximum, 220 grams; the minimum, 108 grams; the average, 155 grams (*cf.* Table 11).

TABLE 11. WEIGHT OF RHOMBENCEPHALON

Maximum	Minimum	Average
♂ 208	144	174
♀ 220	108	155

Having had no literature concerning the weight of each encephalic part of the Japanese, it is impossible for us to bring such into comparison with the results of our study on precox cases. For the present we shall remain content with presenting the results of our own investigation, in the hope that some day there may appear a laborious study on this particular subject. Our autopsical experience on nonpsychotic individuals suggests that the cerebral hemispheres of dementia precox patients weigh apparently less than those of nonpsychotics, while the rhombencephalons of the former seem to weigh as much as the latter.

The grades of mental decline, as contrasted with those of decrease in brain weight will be seen in Table 12. Through both male and female patients nondementia cases give the highest average in the brain weight, and when the dementia advances the brain tends to show less weight, thus there being an apparent parallelism between the rate of decrease in brain weight and the advancement of dementia.

TABLE 12. MENTATION AND AVERAGE WEIGHT OF ENCEPHALON

Latent	Slight	Terminal
(♂ 5 ♀ 5 cases)	(♂ 22 ♀ 9 cases)	(♂ 14 ♀ 31 cases)
♂ 1399	1342	1289
♀ 1206	1184	1153

TABLE 13. MENTATION AND AVERAGE WEIGHT OF CEREBRUM

Latent	Slight	Terminal
(♂ 5 ♀ 4 cases)	(♂ 20 ♀ 8 cases)	(♂ 12 ♀ 28 cases)
♂ 1245	1143	1060
♀ 1028	1007	927

TABLE 14. MENTATION AND AVERAGE WEIGHT OF RHOMBENCEPHALON

Latent (♂ 5 ♀ 4 cases)		Slight (♂ 19 ♀ 8 cases)		Terminal (♂ 14 ♀ 29 cases)	
♂	176	♂	175	♂	172
♀	145	♀	154	♀	155

TABLE 15

Disparity in average weight between "Latent," and "Terminal," Dementia		♂	♀
Encephalon		110	53
Cerebrum		185	104

When we compare the average brain weight of the terminal dementia with that of normal Japanese, we find that the brains of male dementia precox weigh in average 67 to 112 grams less than that of the normal (*cf.* Table 5-A); the average of the female, 61 to 102 grams less than that of the normal male. Therefore, the average encephalon of terminal dementia weighs about 90 grams less than that of normal Japanese. When the average weight of the hemispheres alone is considered in regard to the degree of dementia one will notice its remarkable fall as dementia develops. This phenomenon is invariable in both male and female cases and is the same as in the case of total brain weight. Not so with rhombencephalon. The condition will be noted in Table 14 where the male cases show little disparity in its weight—while the female cases show seemingly a remarkable increase whenever the dementia progresses. It may be justifiable to say that the hemispheres alone are concerned to the mental degeneration, whereas the rhombencephalon has nothing to do with it. Table 15 shows rate of fall in brain weight and that of hemispheres. There is a considerable difference between the disparity of weight of hemispheres alone in the nondementia and the terminal, and the disparity of the total brain weight in the two conditions. This condition is most probable because of the existence of the hydrocephalus ex vacuo in the terminal dementia as is often witnessed at the autopsy. The fluid would escape during dissection, causing a considerable decrease in its weight.

The cerebral hemispheres of the dementia precox are most often about equal in weight, as is seen in Table 1. But this is not without exceptions: in some cases one hemisphere is remarkably different from the other.

If we hunt up the cases showing a disparity of more than 10 grams in both hemispheres we find 28 cases out of 79 (among 106 cases 27 cases had not been separately weighed), the percentage being 35. One with the disparity of more than 20 grams in both hemispheres amounts to 11 cases in the total of 79, *i.e.*, 14 per cent.

There are 6 cases (7.6 per cent) which even show a disparity of more than 30 grams. The significance of this fact is not to be easily determined but is to be decided upon consideration of various associated circumstances. It should be mentioned, however, that there is, as is shown in Table 8, a great disparity in weight between both hemispheres of the idiot (out of 13 cases a disparity of above 10 grams is seen in 7, *i.e.*, 53 per cent; that of above 20 grams, 5, *i.e.*, 38 per cent; that of above 30 grams, 4, *i.e.*, 30 per cent).

The cerebral atrophy is given in Table 1. But the detailed information is to be seen in the following table:

(F—atrophy of frontal lobe, or gyrus frontalis)
 (C.—atrophy of central lobe, or gyrus centralis)
 (P—atrophy of parietal lobe, or gyrus paritalis)
 (O—atrophy of occipital lobe, or gyrus occipitalis)
 (T—atrophy of temporal lobe, or gyrus temporalis)

TALLE 16. ATROPHY OF CEREBRAL GYRI

Location of Atrophy	(40 male cases)		(48 female cases)		Total (88 cases)	
	No. of cases	%	No. of cases	%	No. of cases	%
F	18	25	5	10.4	15	14
P	2	5	5	10.4	4	7.9
F+P	11	27.5	12	25	23	26
F+P+T	5	12.5	10	20.8	15	17
F+T	2	5	2	4.1	4	4.5
F+P+C	1	2.5	1	2.1	2	2.2
F+P+O	1	2.5	0	0	1	1.1
F+O	1	2.5	0	0	1	1.1
F+T+O	1	2.5	0	0	1	1.1
F+P+C+T	1	2.5	4	8.3	5	5.6
F+P+C+T+O	0	0	3	6.3	3	3.3
P+C	0	0	1	2.1	1	1.1
Total	35	87.5	43	89.6	78	88.6
Without atrophy	5	12.5	5	10.4	10	11.4

In male the atrophy occurs in following order: F+P (27.5 per cent), F (25 per cent), F+P+T (12, or 5 per cent), P+F+T (5 per cent), atrophy of F+C+P, F+P+O, F+O, F+T+O, F+P+C+T is found only in one case each.

The total of atrophic male brains represents 87.5 per cent. The like condition is observed in female cases: *i.e.*, F+T, 25 per cent; F+P+T, 20.8 per cent; F, 10.4 per cent; P, 10.4 per cent; F+P+C+T, 8.3 per cent; F+P+C+O+T, 6.3 per cent; F+T, 4.1 per cent; F+P+C and P+C+O, a single case each. The total of atrophic female brains occupies 89.6 per cent.

In the total of 88 cases, both male and female, the atrophy takes place in following order: F+P (26 per cent), F (17 per cent), F+P+T (17 per cent), P (7.9 per cent), the others being very

few. Eighty-eight cases of male and female (88.9 per cent) present atrophy while 10 cases (11.4 per cent) fail to show any signs of atrophy.

The frequency of the occurrence of the atrophy in each lobe is shown in the following table:

TABLE 17. ATROPHY OF GYRI.

Location of Atrophy	♂ (40 cases)		♀ (48 cases)		Total (88 cases)	
	No. of cases	%	No. of cases	%	No. of cases	%
F	33	82.5	37	77.1	70	79.5
P	21	52.5	36	75.0	58	65.9
C	2	5.0	9	18.8	11	12.5
T	9	22.5	19	35.6	28	31.8
O	3	7.5	3	6.3	6	6.8

The writers are particularly interested in what they called "other observations" in Table 1. By simple or grand gyrus (Nos. 1, 28, 35, 42, 55, 67, 77, 87, 92, 98, 106) the so-called macrogyrus is meant in which the convolutions are enormously large and coarse with few accessory sulci and without a winding course. This condition points obviously to the arrest of development.

By hydrocephalus (Nos. 1, 9, 26, 41, 62, 64, 69, 90, 96) the hydrocephalus interna is meant and not what is called hydrocephalus ex vacuo.

Adherent dura mater to the calvarium is observed in 2 cases (Nos. 5 and 80), hypertrophy of dura mater in No. 50, chronic internal pachymeningitis in 4 cases (Nos. 33, 55, 81, 85), and ossification of dura mater in No. 92, all these indicating residuals of internal or external pachymeningitis.

In Nos. 16, 35, 38, 41, 42, 74, 86, the pia mater is found markedly thickened, suggesting an old inflammatory process.

Of hypertrophy and asymmetry of the skull the conspicuous cases only are introduced. These are, it seems to us, the result of some disease process taken place in the developmental stage of the skull.

Cicatricial atrophy, microgyrus and syringomyelia are often found in the central nervous system of dementia precox patients. All these seem to be dated far back in the developmental stage and not the result of disease processes with which we are dealing. The brains with some of these abnormalities are apt to show a great disparity of weight between the two hemispheres (Nos. 1, 7, 8, 6, 9, 16, 27, 31, 39, 41, 47, 55, 60, 62, 84, 87, 90). This fact together with "remarks" in each case would prove that the abnormalities mentioned above are the result of some other disease processes and not of dementia precox. Anomalous conditions are found in 38 cases

out of 106 cases (Nos. 1, 5, 7, 9, 16, 26, 27, 28, 31, 33, 35, 38, 39, 41, 42, 47, 50, 55, 60, 61, 62, 64, 67, 69, 74, 77, 78, 80, 81, 85, 86, 87, 90, 92, 94, 96, 98, 106), *i.e.*, in 35.8 per cent. The percentage of the anomalous brains would be much larger had we examined our material more thoroughly. It should be emphasized that we find at least 35.8 per cent previous diseases in the central nervous system of our precox patients even by macroscopical examination. It is not easily to be decided whether or not these underlying diseases should be considered the etiological factor in dementia precox. However, it is a fact that we often see clinically that the dementia precox develops following some other diseases. The so-called prophhebephrenia is an excellent example of this kind. Anomalous cases would occupy a far greater per cent if the microscopical examination is taken into consideration.

CONCLUSIONS

1. As a first step to the study of dementia precox, the writers have engaged in the statistical investigation of the anatomical findings in 106 brains of dementia precox patients.

2. The average brain weight of the male cases is found to be 1.322 grams, while that of the female is 1.170 grams. The former is 56 grams and the latter 69 grams less than that of the normal.

The brains of male patients weigh mostly less than 1.300 grams whereas the brains of the normal individuals weigh in a larger per cent more than 1.300 grams. Cases weighing more than 1.500 grams are decidedly rarer in precox patients than in normal. In female precox cases no brain weighs more than 1.300 grams, as is often the case in the normal female brains.

3. The average brain weight of the male dementia precox is 29 grams more than that of the general paralytic, whereas the average of the brains of female precox cases weighs 24 grams less than that of the female general paralytic. The average brain of the dementia precox weighs 28 grams in the male, 37 grams in the female, more than that of the idiots.

4. The cerebral hemispheres of dementia precox weigh, in average, 1.142 grams in the male and 1.000 grams in the female. The rhombencephalon of dementia precox weighs 174 grams in the male, 115 grams in the female.

5. The average brain weight of dementia precox decreases when dementia develops. In cases of terminal dementia the brain weighs in average 90 grams less than that of normal Japanese.

6. The cerebral hemispheres of dementia precox show decrease

in weight when dementia advances, while rhombencephalon stays the same.

7. In dementia precox cerebral hemispheres are found to be equal in weight in 65 per cent of the cases, unequal in 45 per cent, showing a disparity of more than 10 grams in 55 per cent, that of more than 20 grams in 14 per cent, that of more than 30 grams in 7.6 per cent.

8. Atrophy of gyrus is noticed in 88.6 per cent of precox brains. The distribution of the involvements occurs in following order: F+P, 26 per cent; F and F+P+T, 17 per cent; P, 7.9 per cent; the rest being very few.

The frequency of involvements in each lobe comes in the following order: F (79.5 per cent), P (65.9 per cent), T (31.8 per cent), C and O (very rare).

Brains of dementia precox show oftentimes alterations which are not directly related to the disease process but are to be regarded as residuals of certain diseases previous to the mental involvement. Such alterations are found in 35.8 per cent, mostly being anomalous gyrus, hydrocephalus, pachy- and leptomeningitis, etc.

10. Clinically, the following are found to be of interest: (a) Death occurs in dementia precox mostly in third to fourth decade, less in fifth and sixth decade, and very rare in seventh and more. (b) Duration of the disease from 5 to 15 years occupies the highest percentage (52 per cent), next coming that of less than 5 years and that from 15 to 25 years in order. The average duration is calculated as 12.5 years. (c) The cause of death is given in following order: Pulmonary tuberculosis, beriberi, nephritis, emaciation, pneumonia and cardiac diseases.

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TRANSLATIONS

EMOTION, MORALITY, AND BRAIN*

BY PROF. C. v. MONAKOW

ZÜRICH

(Continued from page 249)

II. ANATOMY AND PHYSIOLOGY

A clear presentation of the "anatomico-physiological components" of the emotions belongs certainly, as I have already pointed out, to the most knotty problem of all physiological psychology. One asks himself involuntarily: how can a morphological point of view be brought to bear on phenomena which seem to belong exclusively to the "I," that is, to the essentially personal experience, and which issue from our very heart, and are conceived as for ourselves alone; however—as daily experience teaches—every psychic process, as one analyzes the nature of the soul, presents certainly a physiological effect in the brain, whether we will or not. It is inconceivable except as going parallel with the most subtle organization of the nervous system; and as process in the living nervous substance, it must have a material, or, more accurately, a physiologico-biological component. The brain has already been designated by the early investigators, the "material substance of the soul." The physiological-biological component of the soul, especially of the emotions, might indeed be discussed objectively in my opinion to as good advantage as every other physiological process. The chief difficulty in this discussion lies in the need to define that component more accurately, and to outline the limits of the personal "I." Of course, only this factor in the emotions should be discussed fully here, and the subjective "I," with its essentially personal experience, should be considered only in so far as it is necessary to comprehension, as a supplement and control of the physiologico-anatomical component. All the points coming into consideration here naturally can be reviewed to-day only on the purely hypothetical platform, and my exposition to-day has the character only

* Authorized translation by Gertrude Barnes, A.B., and Smith Ely Jelliffe, M.D., of the authors *Gefühl, Gesittung und Gehirn*.

of an attempt to sift critically something of rich anatomico-physiological and biological significance, which was known to us earlier, and to bring it into some sort of relationship, albeit incomplete.

The physiology of the senses and sensation (in contrast to the emotions) has become the object of relatively exact scientific inquiry, in so far as it is a question of a direct objective observation, research extending to that phase which we designate as sensory perception or observation, and the principles involved are universally recognized. Anatomically it is a question here essentially of the most exact possible determination of the paths of innervation, which branch out from the sense organs or surface of the body, in centripetal direction to the primary "centers," and then pass beyond these, through the mid and inter brain to the cortex. This course is mapped out, as you know, according to definite laws and a definite architectonic arrangement. These are in part the routes, the blocking of which, we know from experience, injures or suspends the reflexes released by impressions on the senses or the sensory surfaces. These pathways and centers, even the primary centers (metameric system) are known to-day with a fair amount of accuracy (though for the most part only in rough outline). But, at least in part, some of the finer physiological significance (functions) is not well understood (especially the sectors of projection fibers, which spread out in definite cortical areas). Certain it is that the cerebrospinal paths belonging here, before they become the definite anatomical basis for sensations (sensory stimulations which have been elaborated and "written in," that is, in the form of engrammes, "ideas," etc.) must traverse special groups of nerve cells, fibrillary bands, and molecular substance in manifold directions and must be made use of periodically (rhythmically) in different ways. The same elements, but in other combinations, are ceaselessly being put to different uses. But notwithstanding this it is possible to ascribe certain chronogenic localizations to the physiological performances, and indeed to determine this localization in the cortex, but in a form and combination which has little to do with abstract ideas in their psychological construction. These are localizations in the cortex with which we are familiar, that is to say, the spheres of vision, hearing, and the zones for the extremities, etc.

How does it stand now with the emotions and even with morality in regard to their more definite morphological representation? How can the somatic components of the various values provided with a complicated and rich emotional scale, and with the wider derivations from these be comprehended from a physiological and morphological

point of view? For a little space here I will discuss the elementary emotions or organ-emotions (pain, sensual pleasure, hunger, thirst, etc.), as they disclose themselves in the immediate present; these are, with men and animals, admittedly dependent upon the stimulation of definite cerebrospinal, that is, visceral and sympathetic, nerves, but for our emotions they continually proceed out from definite and relatively clean cut localizations in bodily segments (the emotion of hunger we localize in the stomach, etc.), that is, the relative stimuli flow towards the central organs through the mediation of wholly distinct nerves (vagus, glossopharyngeal, spinal ganglion system, metameric system, etc.).

It is a question therefore of "interoceptive" or "exteroceptive" impressions (pain, for instance) which are supplied to the central nervous system, or the cortex, through routes similar to those serving sensory perceptions, orientation in space, and later gnosis; or perhaps through the same route.

But how is one to regard the primitive instincts, the will, the emotions, feeling of security, etc., from the "physiologico-anatomical" point of view? Do they possess in general a more closely definable, somatic component accessible to a central localization, and how might it possibly be conditioned? To take this greatest of biological enigmas in hand, straightway excites a shudder when we consider the very modest physiologico-biological knowledge we possess to-day. Because the instincts make use of the visceral as well as the cerebrospinal nervous systems in a physiological, always well definable manner, the instincts accordingly build a physiological, and what is more, a most essential physiological source of stimulation for most manifestations of life. This source must spring from the anatomically well-defined points in the central nervous system, since there are a number of well known chemical substances (endogenous and exogenous poisons) which exercise an enormous influence on our instincts, impulses and other primary emotions as well as on the visceral innervation, well known to us anatomically (organs of digestion, circulation, and sexual functions). Hence here at least our desire for an exact physiologico-biological orientation is realized. These are very often phenomena whose manner of working must be regarded as physio-chemical, and as proceeding from definite nervous elements (specific sensitivity, Langley, and others). Also last and not least the fact must be emphasized that we are acquainted with pathological, indeed even prevailingly mechanical moments (trauma, foreign bodies) which, acting diffusely or on very definite

cerebral structures, affect the emotional life in a very definite direction, exciting or paralyzing it.

The question arises: Is the emotional life, equally with the world of sensation, bound only to the central nervous system, and here, specifically, only to the cortex? Concerning the so-called latent higher psychic emotions (derivations of somatic emotions, and possessing engrammes provided with "ideas"; virtues, vices, and so forth), varieties of emotion which presuppose personal experience of value in a definite way, and which for the most part are "grafted on" the primary instincts, as it were, this question is to be answered in the affirmative.

Concerning the elementary emotions, for example, hunger, sensual desire, pain, I cannot answer that question in the affirmative offhand, and further evidence is necessary before I can localize these phenomena in the cortex. Moreover, if we take pain for an example, the answer depends exclusively on how one will define pain. If only such phenomena following excessive stimulation of the bodily surface or inner parts are called pain, as become known to us subjectively as insults and as immediately fall under the subjective category of causality (origin, result), then the painful emotion must be referred to the cortex which is the only mental organ of reproduction which is adapted to receptivity. If we adopt a broader conception of pain, again, for example, in the sense of a chain of defense reactions (to protect the body from pain) more or less graduated according to the intensity of outer stimuli, and if we seek pain everywhere in the organism, where a physically represented "defense of the interests of the injured organ or bodily part" following directly on excessive stimulation, is released, this defense being in a form adapted to the strength and nature of the stimulus; then we can speak of pain as represented even in the separated spinal marrow, indeed, of pain represented in the spinal ganglia. But this is not the current usage, and could lead to confusion. Pain, in the biological sense, that is, in the sense just indicated, must be ascribed in strictness to every living cell, also, too, separately to every cell residing in the human organism ("individual cellular pain"). But then it would be necessary to distinguish various forms or grades of pain (individual, collectively organized, visceral, cerebrospinal or cortical, that is, conscious and unconscious, manifest, latent pain, etc.)!

One sees that the psychic idea of pain (thought of as a unity) and the pain built up biologically from those components and grades do not coincide. For the form of stimulation that one designates

as bodily pain in the clinical sense and in that of daily life (pain recently revived) or conscious feelings of pain (complex formation), may not be regarded as having a sharply limited localization of island-like formation, even if that pain is provided with a more or less acknowledged localization according to our experience; that is, is felt in very definite regions of the body. Certain it is that every group of pathways can be injured without the feeling of pain being necessarily produced as a roughly outlined localization in a member or organ in any place whatever. At any rate destruction of the whole Rolandic region and surrounding region to some distance, does not necessarily cause permanent contralateral hemianesthesia (in addition, destruction of the optic thalamus would be necessary). Indeed, according to my clinical experience, and according to Goltz's and my experimental findings, a dog (or man) deprived of even a whole hemisphere can still possess a lively feeling of pain in that half of the body opposite to the brain injury, though he possess only imperfect topognosia. According to Goltz, a dog deprived of both hemispheres, if he is ill-treated, gives signs or reactions that can be interpreted only in the sense of a painful feeling, imperfectly preserved, of course (pain in the biological sense). The feeling of hunger as well (somatic component) according to this investigator, is not wholly obliterated in the dog deprived of its hemispheres (restlessness, salivary secretion at the time of the accustomed meal).

Concerning peripheral transmission and the subcortical centers for stimuli provoking pain, we are not yet satisfactorily oriented; only this much is certain, that they are mediated peripherally through cerebrospinal sensory nerves, and that, in the central organ (spinal marrow, of course, in a systematized diffuse structure), they spread through the gray substance of the spinal marrow as well as of the oblongata (Schiff, Rothmann) mostly in diffuse manner, but not exclusively so. In the oblongata one must seek the connections for the excitation of pain prevailing in the lateral part of the formatio reticularis (at any rate outside of the lemniscus region). From here on, the relative conduction paths might utilize the fibrillary lattices and arcuate fibers as the preferred route. They conduct to the contralateral hemisphere and, utilizing in part the fibers from fillet to internal capsule and thence to the superior parietal lobule (especially the fibrillar bands) proceed in a scattered manner to the ventral nuclei of the optic thalamus where it is possible they split up. A direct connection of sensory spinal cord fibers with the cortex through the internal capsule does not exist. The connection with the cortex takes place as I have pointed out earlier (1881), through the mediation of

the thalamus nuclei, and probably in such a way that single series of cells must be traversed (whereby a modification in the stimulus might take place), before the result of the stimulus is communicated in a suitable manner to the cortex. Certainly central pains can be engendered by small irritating foci in the thalamus opticus itself or in the immediate neighborhood and communicated to the separate extremities (Edinger, Greiff, v. Monakow, etc.). Such stimuli pass towards the cortex through the mediation of the internal capsule, and are felt as referred pain in the corresponding limbs (especially in the arm). Moreover, in my opinion, every part of the cortex, by a flood of suitable stimuli of various kinds, can produce peripherally felt pains or sensations, most usually proceeding from the small celled upper layers but sometimes from the lower, in the contralateral arm, leg and half of the face (localized) to be sure only if the posterior central convolution is stimulated.

Do all regions participate, and in these do the cell elements in the cortex (nerve cells and molecular substance) participate equally in the production of bodily pains and of visceral emotions (hunger, thirst, sensual pleasure, etc.), there being for this last also definite conduction paths through the inner capsule? This question was slightly touched on earlier. It must now be discussed in relation to the problem of the more delicate phylogenetic division of labor appearing constantly in the nervous system.

We must here enter into the biological assumptions that in the lower animals (for example, worms), that which is produced in the way of primary emotions in the less differentiated nerve cells here (and indeed also in the organ cells closely united with these), in higher phylogenetic development is distributed in the newly won structures, in the same manner as are the increased performances in the regions, sensation and motion in general (as complicated forms of motion and sensation). We might also assume as well, that the progressive differentiations of the senses, sensation, motor cells and "centers" produced also an adequate differentiation in the sphere of emotional representation. Even if every nerve cell in the newly established parts of the brain, entrusted during a definite developmental phase with a more or less specific performance, reaches a certain measure of individual emotional representation—yet the majority of differentiated emotions will be continually the result of the collective activity of the apparatus entrusted simultaneously with the construction of the higher psychic performances. This apparatus in the course of phylogenetic changes becomes localized in the frontal end (the cortex in mammals), and there remains now for decision only

the important question whether or no, in what degree, and in what way, the morphological representatives of the emotions in the mid-brain, metameric system, and ganglion system, have limited their erstwhile sensory performances and turned them over to the cortex.

This question, of course, can be answered only in a very general way. The import of the morphological and incontestable phylogenetic migration of function towards the frontal end and the division of labor inaugurated thereby in the central nervous system (upwards through the animal scale) lies in enriching the sphere of new forms of excitation, in an improved organization of performances through economy in space and effort, and in transplanting the complicated forms of the "collective mneme" (imprint of the engramme, ekphorie) into the sphere of the great cortical surfaces with its millions of nerve cells, histologically differentiated with no greater delicacy. Only in such surfaces in the anterior end (roof of the mid-brain in lower vertebrates) is sufficient space present for a development *en masse* of the newer forms of excitation (experience).

In all cases where new nerve centers, more richly equipped tektonically, grow out of primitive, ancient foundations, and where morphologically young forms of apparatus are differentiated out of the primitive cell connections in the direction of the anterior end, we see the following morphologico-histological modifications appear—in my opinion essential and exceedingly important—in which doubtless the histological representatives of the emotions have their share.

The number, magnitude, and morphological differentiation, especially of the important somatochromic elements (nerve cells) in the primitive anatomical centers (for instance, "motor" nuclei) steadily decrease absolutely and relatively, upwards through the animal scale. The vanishing material is employed for the upbuilding of new, differently conditioned basic material. The appearance of new nerve substance takes place, according to my conviction, by proliferation of young cellular forms, which histologically are less richly differentiated than their progenitors; what they lack in the latter connection they make up by their great number and close grouping, as well as through richer fibrillary structure and branchings (rich molecular substance. There are, moreover, cells which already appear in part in the very first organization of a nervous system (already in worms) but only in scanty number. I have in mind in this connection (for example, in the red nucleus) the transitional forms between small star-like and mitral formed cells and the granular cells present sometimes in the lower vertebrates, cells which attach themselves as "satellites" in moderate number to the principal

elements. One acquires everywhere the impression that phylogenetic development of the small elements increases at the expense of the large nerve cells, namely, the largest and especially richly differentiated; but also, moreover, that the large elements in single instances accompany the young, small cell groups on their progress towards the frontal end or cortex. In the wider series of changes, many an old tektonic organization is changed in the phylogenetically young foundation to a new tektonic grouping, which above all in the cortex are placed far apart but connected through association and projection fiber paths (distribution of definite structures to many parts of the brain).

The various new parts of the brain, which arise in this way, acquire indeed very definite morphological boundaries; their functional independence is much curtailed by the circumstance that every conduction section assumes only very definite components of a function, and that the old parent centers, now become rudimentary, retain still only a certain persistent "scaffolding" of their original activities. In other words, the new structures are formed by various mutual displacements, and new groupings or adaptations to new spatial relationships, in keeping with the functional duties assigned them (for many of which we have not yet formulated the correct question upon which to pursue our quest on the physical side). Freeing themselves from the parent alliance, they take the new position referred to them with their attitude in keeping with that part of the brain situated at the most frontal ends, this being in higher mammals the cerebral cortex. At this stage of development we come to cortex representation of the various bodily sections. To reiterate: The various old and new "colonies" keep more or less in touch with one another, and many a persistent part of the old phylogenetic structure is fairly unchanged in the new colonies. The last, *i.e.*, the cortical substructure, has, however, the purpose of joining those functional parts in the activities of which the principal rôle is played by mnemonic fixation and rich combinations of successively acquired forms of stimulation; that is, where there is less stress on the specific function of the single elements than on the collective operations in various directions, and an exact, temporally arranged organization of performances. Only thus is constructed social nervous government with numerous psychic interests, which are held in bounds through differences in the importance of the various demands.

The question now forces itself upon us anew: How are the morphological representatives of the emotions affected in this divi-

sion of labor in the nervous system, a division that is on a great scale although restricted within definite limits and determined in its course by the old phylogenetic tektonic organization? What part in the production and building up of the "somatic" and "psychic" emotions do the various sorts of cells and fibers in and outside of the central nervous system take? Here, just as with pain, we must first distinguish the individual "emotion" in single cell ("cell instinct" in the biological sense) from the various forms of collective organization of the conscious emotions (collective, total emotion of the creature), and then distinguish the emotions which lie below the threshold of consciousness, the unconscious emotions and such as exist in the latent and preparatory state. According to my opinion, as already indicated, an extreme minimum of wish-impulse as well as feelings of pleasure and pain in the biological sense are represented in every germ cell, indeed in every living cell even of the mature individual, and come into expression perhaps through momentary biochemical composition of the living protoplasm. Moreover, the vigor and magnitude of this biological "individual cellular emotion" which of course is as far removed from conscious human emotions in the sense of common parlance, as heaven from earth, may not differ overmuch in the various organ cells of the body, of course with the exception of the nerve cells (*cf.* also "World as Will and Idea," by Schopenhauer).

Through the coöperation of the various cellular elements in the cellular body conditions, and through the division of labor which has sprung out of cellular conflict, that is, through breeding and cultivation of specialized factors, even for the representation of the emotions, differences sprang up between all elements (in and outside of the nervous system) sharing in the erection of various forms of emotion, which, through their position in the total development of the human individual, differ enormously according to their content in origin and life economy value.

Before all in this respect, we must hold to the fact that numerous delicate emotional distinctions presuppose a rich individual experience and the having lived through many emotionally toned events, and that the biological causality plays a powerful rôle even in the world of emotion.

If we anticipate at this opportunity the pathology of the emotions, that is, draw into the discussion the injuries incurred in the emotional world through poisons or pathological processes in the brain, then we are led to the following morphologico-physiological conclusions which few at the present time deny. As is well known,

the structures which serve as an anatomical basis for the elementary sensations (in contrast to emotion) and motions are confined certainly only to the central nervous system, and in the spinal and sub-cortical regions, and upwards to the cortex are arranged in a strictly tektonic plan. They are distributed according to members or parts of members, or according to synergies or synkinesias or according to reflex components released from definite sense organs. They are organized in the form of local (anatomical), relatively sharply defined stations and directions, even to those parts where complicated stimuli combinations and derivations from them begin, and where, for the successful result of the stimulus, the temporally, that is, historically differentiated structure is the one of importance and the specific function of the single cells reaches zero. In contrast, the stations of innervation for the emotions arising consciously in the immediate present, or resting in the latent state, and indeed the stations of innervation for the primary emotions (pain, hunger, etc.) are already relatively diffusely represented in the spinal and mesencephalic nervous system (although represented optimally in the known cerebrospinal conduction paths and "centers").

(To be continued)

SOCIETY PROCEEDINGS

AMERICAN NEUROLOGICAL ASSOCIATION

FORTY-NINTH ANNUAL MEETINGS MAY 31-JUNE 1, 2, 1923. HELD
AT BOSTON, MASS.

The forty-ninth annual meeting of the American Neurological Association was of exceptional interest. A very large number of members and neurologically interested physicians were in attendance. The first two days meetings were held in the amphitheatre of the Peter Bent Brigham Hospital; the third day's meeting was held in the Psychopathic Hospital. Discussion was very limited, chiefly by reason of the surfeit of papers.

Presidential Address: Dr. Henry Cushing opened the meeting with some general remarks on the development of neurosurgery and deferred his "Report of a Case" to the annual dinner. This case was that of his own. In this report Dr. Cushing, in an interesting and delightful manner, sketched the situation relative to neurosurgery as it existed when he was a student. He commented on his early work with Horsley, in London, and later with Kocher, in Berne, and still later, at Johns Hopkins, how more by accident than by design his own development along the paths of neurosurgery had been determined.

Meyer, A.; Bagley, C.; Richter, C. P. EXCITABLE CORTEX OF ALLIGATOR BRAIN. This demonstration was given by Dr. Bagley. The technic of photographing the movements was shown by lantern slides. The results of stimulation were then demonstrated. The results of the experiments showed that stimulation of the entire cortex gave response only along the middle third of the dorso-mesial surface. When this surface was electrically stimulated progression movements were produced with swinging of the tail toward the side of the hemisphere stimulated; these movements have been recorded by tracings. Repeated experiments in the same animals and in six different animals gave constant results.

Elsberg, C. A.; Schwartz, C. W. INCREASED VASCULARITY IN INTRACRANIAL DISEASE. Dr. Elsberg showed a number of radiographic pictures of the skull, putting particular emphasis upon the predominance of swollen venous channels as offering some assistance in the localization of brain tumors. Endotheliomata seemed to give some definite pictures, thus permitting possible nosological conjectures as well as localization certainties.

Tucker, B. R. VAN RECKLINGHAUSEN'S DISEASE. It would appear that many more cases of this type of disorder are to be found

than would appear from the literature. This may be due to the prominence of the negro population in the area in which Dr. Tucker gathered his material. Photographic slide projections of eight cases were shown. The general historical and neurological features were referred to. Some tumors contain no new tissue. Redundancy of tissues in the face and other parts of the body may be associated with the condition, and endocrine factors involved in skin and fat metabolism were pointed out. Complete details of neuropathological interest in one autopsied case were shown by lantern slides.

Stookey, Byron. HYPERNEUROTIZATION. In special studies made upon peripheral nerve injuries of the war, begun under the direction of Huber of Ann Arbor, the author directed his attention to certain physiological muscle responses and to histological evidences of development of regeneration of muscle end plates. These were utilized as a foundation for further surgical therapeutic efforts through muscle to muscle implantations as a means of reestablishing neural activities in muscles or muscle groups cut off by peripheral nerve injury. Stookey showed kymograph tracings and histological sections which pointed in the direction of definite possibilities for improvement along such neurosurgical lines.

Bailey, Percival. EPENDYMAL CELL TUMORS. A large series of ependymal cell tumors collected from Cushing's tumor material of nearly 900 cases were rapidly shown. The lantern slides demonstrated the site of many of these and the histological details were amply illustrated. These tumors were mostly located in and about the fourth ventricle, but might be found in other locations. Technical operative procedures were discussed rapidly and differential clinical diagnostic features outlined.

Wilson, George. CRURAL MONOPLÉGIA AND PARAPLEGIA OF CORTICAL ORIGIN WITH A DISCUSSION OF THE CEREBRAL CENTERS FOR THE BLADDER, RECTUM, AND SEXUAL FUNCTIONS. Four cases are reported, two afforded pathological evidence, illustrating the conditions mentioned in the title.

Horrax, Gilbert. VISUAL HALLUCINATIONS AND TEMPORAL LOBE TUMORS. Dr. Horrax first gave a very short review of the literature bearing upon the occurrence of visual hallucinations as they have been observed occurring with gross somatic lesions of the brain. In the majority of cases these visual hallucinations, he states, have been allocated to lesions of the occipital lobes.

Certain authors have referred such hallucinations to lesions of the optic tracts, and still others have observed them in involvements of the temporal lobes. It is to this last type of hallucinations that the paper calls particular attention. In it he analyzes the pathological findings in fifteen cases of temporal lobe tumor from Cushing's clinic. Gliomatous cysts, solid gliomata, and irregular tumor lesions are all accompanied by various types of visual hallucinations. The dynamics of the hallucinations in their relation to the areas involved were not elucidated, but certain relationships between their occurrence and the site of the lesion were pointed out.

Stookey, Byron. SPINAL CORD TUMORS AND BLADDER AND RECTAL DISTURBANCES. This paper was read by title. It dealt with a minute analysis of segmental distribution of spinal cord tumors in ninety-three cases and correlated disturbances of bladder and rectum function from the standpoints of temporal occurrence as well as of localization values.

Wilson, S. A. K. THE OLD MOTOR SYSTEM AND THE NEW. Dr. S. A. K. Wilson of London presented this paper, with projections. He traced in a general way the phylogeny of the motor system in lower forms and showed the gradual evolution of the plastic tonus system and the kinetic voluntary system. Within the striatum was located the early, paleostriatum, and the later, neostriatum (Kapper's), functioning structures for the early vertebrate motor systems. With the gradual evolution of discriminative motor functioning the cortical pyramidal systems developed. Dr. Wilson traced in an inimitable manner the steps of this evolutionary process, illustrating by well-selected slides the gradual development of the various correlated functions making up the old automatic motor systems and the newer discriminative systems more and more under intelligent, reasoning control.

Cobb, Stanley, and Meller, Hugo. BASAL GANGLIA SYMPTOMATOLOGY. Dr. Meller delivered this cinema-illustrated paper, which consisted of experimental work with monkeys poisoned by manganese. These monkeys were to be seen in the laboratory of the neurological department.

Experimental work on the basal ganglia, they said, has not, to date, resulted in the production of the clinical picture attributed to lesions of these structures. It is known that workmen employed in an atmosphere containing manganese dust develop symptoms similar in many respects to those of the Parkinsonian syndrome. In evolving an experimental method to produce these symptoms it was deemed worth while to try manganese intoxication of monkeys. A manganese salt was administered over a period of eighteen months to a series of four monkeys. They first developed choreoathetoid movements and later rigidity accompanied by disturbances of motility, and in two cases fine tremors of the hands. Histologic studies show definite cellular changes in the striatum and pallidum with hemorrhage and fibrosis of the liver.

Hunt, J. Ramsay. NEURAL MECHANISM UNDERLYING THE FUNCTION OF CENTRAL INHIBITION. In the nervous system two great divisions of nerve function may be recognized: the one excitatory or *erethistic*; the other inhibitory or *kolytic*. The existence of these two functions of nerve tissue are recognized at the vegetative, the sensorimotor, and psychic levels of the nervous system. In the vegetative nervous system the existence of both excitatory and inhibitory fibers is recognized and the function of viscera is under the control of this dual neural mechanism. In the central nervous system, however, while the existence of an inhibitory function is recognized at all levels, somatic and psychic, there has been no attempt to correlate any

special group of cells or system of neurones with the function as opposed to that of excitation.

In previous studies of the corpus striatum the author presented evidence in favor of such a correlation by identifying the large multipolar cells of the striatum belonging to Golgi's Type I with the motor function of excitation and the small cells of the neostriatum belonging to Golgi's Type II with the function of inhibition. Loss of the large pallidal cells causing a paralysis of striatal function (paralysis agitans); loss of the smaller cells of the neostriatum causing a paralysis of inhibition with release of motor function (chorea). According to this conception the pallidal cells belonging to Golgi's Type I are excitatory, and the neostriatal cells belonging to Golgi's Type II are concerned with the inhibitory function of this mechanism. The author would extend this hypothesis to include other parts of the central nervous system and suggests the theory that the small nerve cells of Golgi's Type II are concerned with the function of inhibition in the central nervous system. Cells of Golgi's Type II are found in various parts of the central nervous system; the spinal cord, cerebellum and cerebrum. The cerebral cortex is especially rich in cells of this type. That cells of this type are absent from the vegetative nervous system would tend to confirm the hypothesis as here both inhibitory and excitatory neurones are demonstrable while in the peripheral motor neurones which are of central origin inhibitory fibers are apparently absent. The relation of spinal convulsions (strychnine) and cortical convulsions to the inhibition mechanism is considered. In conclusion the author reviews the theories of Cajal and von Monakow pertaining to the function of nerve cells belonging to Golgi's Type II.

Weisenburg, T. H., and Stack, Stephen S. UNILATERAL LESION OF THE PONS, GIVING THALAMIC SYNDROME IN ADDITION TO ATHETOID MOVEMENTS. A tuberculous tumor of gradual onset which finally involved the lower two-thirds of the right side of the pons and upper part of the adjacent medulla, caused central pains in entire left side of body, followed by left-side motor weakness, impairment of all forms of sensibility with disturbance of muscle sense and astereognosis and athetoid movements in left arm. Later there was impairment of associated ocular movements to the right and paralysis of the right fifth, sixth, seventh, eighth, ninth, and tenth cranial nerves.

Pathology: Serial sections made of the entire striatum, thalamus, subthalamic region and cerebral peduncle showed no involvement. However, there was a small tuberculous tumor in the inferior median portion of the left lobe of the cerebellum which caused slight pressure on the left restiform body. This cerebellar lesion was very small and it is questionable whether it caused any alterations of the function of the restiform body. The cerebellar nuclei, as well as the cortex, were normal.

The case shows that a tumor in the pons, involving the sensory tracts, may cause the same symptoms as those commonly ascribed to the thalamus. The athetoid movements on the left side are difficult

to account for. They are not the result of a cerebellar lesion, for there was no dyssynergia. They were not due to striatal involvement.

Casamajor, L. H., and Tilney, F. CORPUS STRIATUM AND SUBSTANTIA NIGRA AND ANIMAL BEHAVIOR. This series of lantern slides shown by Dr. Casamajor, drawn from comparative and from embryological material and based upon the Flechsig myelination method, was designed to illustrate the gradual development of the primary activities of animal behavior in correlation with the gradual myelination of definite fiber tracts and synaptic junctions.

Abrahamson, I., and Rabiner, A. N. LETHARGIC ENCEPHALITIS SYNDROMES. These authors presented a study of certain mutations which occur in the encephalitis syndrome, some of which come and go and some of which are permanent. They showed, as has been demonstrated by other investigators, that altered emotional states (psychical dynamisms) can completely change the picture in certain cases. Thus they presented descriptions of generalized choreiform myoclonic syndromes being entirely replaced for a time by a syndrome which would have been described as hysteriform according to older descriptive modes. This new mutation phase was characterized by generalized immobility, impassivity, and hemianesthesia. When the emotional stimulus had passed, singing, music (transference stimulus), the patient showed the generalized movement syndrome. In another patient a group of illy defined "hysteriform" manifestations which had existed for several months was replaced by a typical dystonia musculorum syndrome. [Compare Vogt, Hesnard, etc.] In still another a severe and apparently chronic Parkinsonian syndrome disappeared entirely in twenty-four hours and had not reappeared. A number of phasic mutations in the Parkinsonian syndrome were related and certain suggestions offered concerning the complex factors of the paleokinetic importance of the involvement of certain structures in the basal ganglia or older kinetic zones.

Cushing, Harvey. TUMORS OF THE BRAIN. Dr. Cushing gave a three-hour clinic demonstrating a large number of brain tumor cases.

Strauss, Israel, and Globus, Joseph H. NEUROPATHOLOGY OF THE PARKINSONIAN SYNDROME FOLLOWING EPIDEMIC ENCEPHALITIS. The frequency with which acute epidemic encephalitis terminates in a clinical picture not unlike the Parkinsonian syndrome, and the rarity of anatomical observations made in such cases, give to the case herewith reported an unusual interest. The patient, a man thirty-seven years of age, except for the accidental loss of his right eye, was well up to February, 1920. He then became suddenly ill with a moderate rise of temperature, general body pain, drowsiness, alternating with occasional episodes of delirium. He remained in bed twelve weeks, making full recovery. Six months later, without any febrile reaction, there began a gradual and progressive development of the outspoken Parkinsonian syndrome. At first there appeared a tremor of both upper extremities, soon followed by a similar tremor in lower extremities; with this there developed rigidity,

tendency to propulsion, masklike expression of the face, pill-rolling movements of the fingers and profuse sweating. There were no localizing signs except some narrowing and irregularity of the left pupil. The condition remained stationary until December, 1921, when a sudden change occurred, associated with a rise in temperature, swelling and inflammatory changes in the joints. Death occurred in January, 1922, with bronchopneumonia and myocarditis as the terminating events.

Gross Anatomy: Findings limited to a distinct and marked narrowing of the substantia nigra, which appeared much lighter in color than normal. *Microscopic Anatomy:* Positive findings based on an exhaustive search of entire brain substance:

Cerebral cortex, normal in all regions; *Subcortex*, only occasional lymphocytic infiltration of blood vessels; *Striatum*, normal; *Pallidum*—(a) no reduction in number of cells, (b) only slight occasional degenerative changes in ganglion cells, (c) no increase in fat content, (d) occasional mild lymphocytic infiltration of blood vessels; *Thalamus*, nucleus ruber and corpus Luisii, normal; *Substantia nigra*, most striking and definite changes, limited to the zona compacta—(a) striking reduction of ganglion cells, (b) the cells found in the area showed marked degenerative changes and loss of pigment material, (c) marked gliosis with rosette formation, (d) frequent perivascular infiltration, (e) reduction in iron content; *Myelin stains* of serial sections did not bring out any definite changes in fiber structure.

Globus, Joseph H. SYMPTOMATIC CHOREA ACCOMPANYING DIPHTHERIA. The case is of interest because it was considered as a choreiform type of acute epidemic encephalitis until postmortem examination of the cerebrospinal fluid under sterile precautions disclosed the organism and because of the unusually limited anatomical findings. The patient, a girl twenty-nine years of age, several weeks after an attack of tonsillitis from which she was said to have made good recovery, was admitted to the Eppendorfer Krankenhaus with the diagnosis of chorea gravissima. In addition to the violent choreiform movements she developed mental signs which demanded her transfer to an insane asylum. There the diagnosis of choreiform type of acute epidemic encephalitis was made. She showed no focal signs and no pathological reflexes. She at first showed improvement but then there occurred a sudden change with death taking place the eighth day after admission. Autopsy, done within half an hour after death, disclosed: (1) Diphtheria bacilli in cerebrospinal fluid; (2) congestion of the pia, with no other changes on gross inspection of the brain substance; (3) microscopically a most thorough search of the brain substance being made, no changes except those in the striatum were noted; (4) in the striatum—(a) marked increase in fat equally distributed in the large and small ganglion cells, (b) Nissl preparations showed definite degenerative changes in large and small ganglion cells, (c) occasional large ganglion cells found in the process of neuronophagia, (d) slight increase in the protoplasmic glia cells.

Hassin, George B. COMPARATIVE HISTOPATHOLOGY OF ACUTE ANTERIOR POLIOMYELITIS AND LETHARGIC ENCEPHALITIS. In a case of acute anterior poliomyelitis and in one of acute epidemic encephalitis the sites of the lesions were the same. The histopathologic difference lay in the intensity of the parenchymatous changes which in anterior poliomyelitis involved not only the ganglion cells of the ventral horns, but also the nerve fibers of the latter as well as the anterior roots. In the case of lethargic encephalitis these were for the most part spared. The meninges and the vascular changes were also more intense in the poliomyelitis case, while in both cases the central canal contained the same infiltration elements as found in the densely infiltrated Virchow-Robin spaces. This fact indicates that the contents of the latter are discharged to some extent at least into the central canal, that the flow of the tissue fluids is toward both the subarachnoid space and the central canal.

Gordon, Alfred. EPIDEMIC ENCEPHALITIS AND SYPHILIS. DIFFERENTIAL DIAGNOSIS. Formerly any symptom-group presenting manifestations of cranial nerves, especially of extraocular nerves, invasion of the pyramidal pathway, slight meningeal reaction, also some alteration in the mental activity, was considered of syphilitic origin. With the advent of lethargic encephalitis the above combination of symptoms has been considered of encephalitic nature. There was evidently an extreme view in both cases. The author undertook a close study of the subject for the purpose of finding differential points of view so that a definite diagnosis could be established and an appropriate treatment instituted. Eighteen such cases have been submitted to prolonged study and observation. The following data had been investigated:

(1) The Wassermann reaction; (2) cellular count of the spinal fluid; (3) eye symptoms; (4) fever; (5) somnolence; (6) motor tract; (7) sphincters; (8) pain; (9) mental phenomena; (10) Parkinson's syndrome.

The conclusions at which the author has arrived are as follows:

1. The Wassermann reaction is to be relied on only when it is positive.

2. The cytology of the spinal fluid. The marked diminution during the course of the disease of the number of lymphocytes favors encephalitis lethargica. Persistence of a large number of cells (although somewhat less than the original number), favors syphilis.

3. Late appearance but eventual disappearance of diplopia favors encephalitis. Early appearance and persistence of it point to syphilis. The same may be said of ptosis and of Argyll-Robertson's pupillary reaction.

4. Among motor phenomena the presence of myoclonia is of some diagnostic value. It is usually absent in syphilis of mesencephalon, but present in encephalitis.

5. Parkinson's syndrome may be present in both. In encephalitis the tremor is slight but persists indefinitely, while in syphilis it

is marked and eventually disappears when the patient is under treatment.

6. Somnolence cannot serve a diagnostic purpose in the beginning, but later in the course of the disease it is protracted in encephalitis but not in syphilis.

7. Mental phenomena in encephalitis may be manifested in delirious or confusional outbreaks, but in syphilis there is only mental dullness.

8. Sphincters as a rule are not involved in encephalitis, but they are disturbed in syphilis.

9. Finally, fever is usually present in encephalitis, but absent in syphilis.

Mehrtens, Henry G., and Barkan, Otto. RESEARCHES ON THE PUPILLARY REACTIONS IN EPIDEMIC ENCEPHALITIS. Frequent references have appeared in literature during the last two years to the appearance of the Argyll-Robertson pupil in epidemic encephalitis. It was decided to investigate a series of thirty-six cases of encephalitis with the aid of the pupilloscope, in order to determine the frequency of a true Argyll-Robertson phenomenon. The following conclusions were reached:

1. No Argyll-Robertson pupils were found.

2. A sluggish light reaction was always part of an ophthalmoplegia-interna.

3. Isolated paresis of accommodation in which the pupillary reaction was normal was also a frequent sign.

4. The pupil, in encephalitis is often mydriatic and is round or ovoid, in marked contrast to the serrated irregularity of the syphilitic pupil.

5. As a result of our investigations we would define an Argyll-Robertson pupil as one in which the light reaction is reduced or absent in the presence of a normal convergence-accommodation reaction, in agreement with the definition of Argyll-Robertson himself, but we believe it necessary to also stipulate (as he himself seems to have implied) that the accommodative power (ciliary muscle) be intact. Unless this be done an ophthalmoplegia interna may be erroneously diagnosed as an Argyll-Robertson sign.

Paton, Stewart. SOME OF THE CHIEF CHARACTERISTICS OF THE SO-CALLED INSTINCTIVE REACTIONS. It is desirable occasionally for neurologists and psychiatrists to review their reasons for wishing to be members of the same society. The importance for close coöperative effort is emphasized as soon as we try to study instinctive reactions. Broad biological views are impossible unless we consider structure as well as function. We need to study carefully in the embryo the development of the muscular and endocrine systems in order to understand the motor attitudes and habits formed in adjusting life. Early in life of the embryo the thyroid and adrenals are supplied with nerves and apparently prepared to function. Overactivity of these glands during embryonic life predispose individual to develop con-

ditions suggestive of apprehensiveness and fear soon after birth. In a great many infantile reactions variations occurring in structure and in physiological responses are responsible for imperfect adjustments taking place in life of the individual. A closer study of the machinery will doubtless explain some of the mysteries now associated with the subconscious. Not at all improbable that some of the factors directly responsible for the differences between the intravert and extravert type of personality may be found in the motor attitudes and habits depending entirely upon structural conditions. Instinctive reactions to a large degree are determined by the anabolic or catabolic changes in living organism.

Riley, H. A. THE THALAMIC NUCLEI IN PRIMATES. This paper was read by title.

Mussen, A. T. THE DORSAL AND VENTRAL SPINOCEREBELLAR TRACTS. A continuation of studies presented at the last meeting of the Association. Further observations of extra experiments go to show that these tracts send fibers to the posterior region of the vermis, as well as to the anterior portion, as previously reported.

Mussen, A. T. NUCLEI OF THE POSTERIOR COLUMNS, AND THE ORIGIN AND DISTRIBUTION OF THEIR FIBERS. This paper was read by title. It demonstrated:

(1) The internal arcuate fibers arise from the nuclei throughout their entire extent; (2) the fibers from the nucleus gracilis occupy a median position in their course to the thalamus; (3) the median fillet terminates in the medioventral nucleus of the thalamus; (4) the external arcuate fibers, both direct and crossed, arise from the lateral region of the nucleus Burdach (the nuc. v. Monakow or Blumenau) in its upper third; (5) the dorsal external arcuates run to the cerebellum through the restiform body of the same side; (6) the ventral external arcuates decussate, and pass on to the cerebellum through the restiform body of the opposite side; (7) the external arcuate fibers, both direct and crossed, are distributed to the vermis throughout its entire extent.

Bloch, E. Bates, and Oppenheimer, R. H. INTRASPINAL PRESSURE, BLOOD PRESSURE, AND INTRAOCULAR TENSION. The authors demonstrated the following:

Group I. The blood pressure, intraocular tension and intraspinal pressure were recorded consecutively.

Group II. After the above procedure a small quantity of spinal fluid was removed and the readings repeated.

Group III. After the procedure in Group I a larger quantity of spinal fluid was withdrawn and the readings repeated.

Group IV. Notes on special cases such as groups of diseases, reports on tests made: during convulsions, and after lowering the intraspinal pressure artificially.

Kennedy, Foster, and Stevenson, Lewis. TESTICULAR TERATOMA WITH SECONDARY DEPOSITS IN THE SPINAL COLUMN AND MENINGES. This case is presented because of certain uncommon features

in its microscopic examination, some of which explained a confusing clinical picture.

The patient was thirty-eight years of age. Luetic infection occurred at the age of twenty. No other previous history of importance. The first symptom of spinal cord disease was in October, 1922, when he experienced a series of severe girdling pains in the distribution of the first lumbar roots. At the beginning of February of this year he noticed a weakness of the left leg, which, in fifty-six hours, was useless. Paralysis of the bladder and rectum followed rapidly, and in three more days there was flaccid paralysis of both lower extremities and of the lower trunk muscles, together with a loss of all sensibility from the level of the fifth dorsal segment downwards. Poorly defined sensory losses were noted above this level. Sacral bed sores speedily developed. The spinal fluid was yellow, rich in globulin, and was reported to contain 975 leucocytes per cubic millimeter, by two good observers. An enlarged testicle was thought to have been the result of an old orchitis. The blood Wassermann was positive.

An extensive laminectomy in the lower cervical and upper dorsal region revealed a dry cord, but no sign of the expected abscess. The patient died on the day following his operation.

Dr. Douglas Symmers presented the autopsy report, of which the following is a condensation: Tumor nodules were found in the left testicle, in the liver and diaphragm, and in the vertebral column from the second to the seventh dorsal vertebrae. The spinal cord in the region of the tenth dorsal vertebra was adherent to the anterior surface of the canal. The bone was here eroded and the spinal tissue below this point was entirely necrotic. Sections of the original tumor and of the metastases showed it to be a large celled carcinoma with lymphoid stroma of teratomatous type. Sections of the liver nodes showed, amongst other things, several nerve fibers of adult type—an uncommon feature of such a tumor. Sections of the spinal cord through the softened area revealed masses of tumor cells invading the dura.

As far up as the mid cervical region sections of the cord showed an ascending myelomalacia with venous thrombosis here and there visible. In places cross sections of the cord had the appearance of a skeleton leaf with little of the nervous tissue left and only the neuroglial framework remaining.

The diagnosis of spinal cord abscess was reached through a consideration of the clinical course and the high count of what were taken to be leucocytes in the spinal fluid. As no inflammatory changes were found the authors were compelled to believe these cells were not white blood cells, but were cells thrown off by the tumor or possibly gitter cells. Thrombosis of the venous spinal system explains the degeneration above the level of the tumor and excuses, perhaps, their erring diagnosis.

Schaller, Walter F. SPASTIC PARAPLEGIA IN FLEXION DUE TO CORD COMPRESSION BY A SPINAL TUMOR. Case report with especial reference to this type of paraplegia. Successful removal of an extra-

medullary cord tumor in the lower cervical region, situated on the right anterolateral aspect of the cord anterior to the dentate ligament.

Spiller, William G. CENTRAL PAIN IN SYRINGOMYELIA AND DYSESTHESIA AND OVERREACTION TO SENSORY STIMULI IN LESIONS BELOW THE OPTIC THALAMUS. Pain in syringomyelia has been frequently recognized and usually has been attributed to meningitis or implication of the posterior roots, but a case is recorded by the author in which neither of these lesions was found by microscopical examination, although severe pain had been present during life. The occurrence of central pain, *i.e.*, pain caused by irritation of central afferent fibers, is discussed, and the views of different writers on the subject are considered. Dysesthesia and overreaction to sensory stimuli may occur when lesions are below the optic thalamus, and two cases are recorded by the writer as evidence for this statement.

Ayer, James B. SPINAL SUBARACHNOID BLOCK AND SPINAL CORD COMPRESSION. Spinal subarachnoid block, the author maintains, is the most dependable sign diagnostic of compression of the spinal cord. In clinical studies made during the past three years Ayer was able to demonstrate block in 44 cases. Of 23 cases in which cord compression from tumor occurred 22 showed block by dynamic tests, and all showed abnormal fluids. The spinal fluid examination was the deciding factor in leading to operation in at least eight patients. Abnormal fluid was found above five tumors of the cauda, and localization was possible by differential punctures.

While block may be demonstrated by lumbar puncture alone, more dependable information is obtained by double or multiple punctures. A careful dynamic and chemical study is recommended in every case presenting unexplained transverse myelitic symptoms.

Tilney, Frederick, and Pike, Frank H. EXPERIMENTAL ANALYSIS OF SOMATIC SYNERGY AND ITS PROBABLE CEREBELLAR REGULATION. Somatic synergy is accepted to be dependent upon the coördinative myotonic relation existing between the various groups of skeletal muscles. The actual nature of this relation, reduced to its lowest terms, must be sought in the most simple type of muscle grouping; that is, the so-called agonist-antagonist group. The conditions here discovered should furnish an important key to the general problem of coördination.

What, therefore, is the physiological relation of an agonist-antagonist group during action? Is it, as Sherrington believes, one of reciprocal inhibition, namely, a phase of simultaneous contraction in one muscle with relaxation in its opponent?

A series of carefully controlled experiments upon animals has failed thus far to reveal any evidence of such a relation; in fact, from our own observation quite the reverse has most frequently proved to be the case. In action, under stimulation of the cerebral cortex or as a result of spontaneously produced movements in the experimental animal under light anesthesia, both the agonist and antagonist muscles are cocontractive; *i.e.*, contract simultaneously. This reaction seems to justify the conception of the *synergic unit*

previously advanced by one of the authors on the grounds of clinical experiment.

How is this cocontractive type of synergy maintained and what part of the neuraxis is devoted to this function? Our experiments indicate that the synergic unit is most readily disorganized by cerebellar lesions, and that the position of the lesion determines the degree and extent of synergic disorganization.

From the experimental clinical evidence of this research it is argued therefore: 1. That somatic synergy is fundamentally dependent upon a cocontractive phase in the activity of the muscles forming synergic units throughout the body. (The agonists and antagonists.) 2. That the muscles dominant in producing the direction of action in any movement are simultaneously checked and restrained in their speed, rate, and degree of contraction by their corresponding antagonists to the end that the movement may be well coördinated. 3. That the loss of this cocontractive relation in the synergic units produces the clinical symptom of ataxia. 4. That the cerebellum occupies a preëminent position for the maintenance of such cocontractive relationship between agonist and antagonist in the function of somatic synergy.

Goodhart, S. P., and Kraus, W. M. THE RÔLE OF THE INTEGRATIVE ACTION OF THE SPINAL CORD IN DETERMINING POSTURES OF THE LOWER EXTREMITIES IN DYSTONIA MUSCULORUM. This paper, which was a cinema demonstration, sought to show:

1. The endogenous fibers of the spinal cord are capable of so coördinating the activities of anterior horn cells and, thus, of the muscles, as to produce when adequately stimulated definite and stereotyped postural pictures.

2. (a) In the first stages of dystonia musculorum the position of the leg is often like that seen in paraplegia in extension. As the disease progresses this position changes to one in many respects like that of its opposite, paraplegia in flexion. (b) Contractures occurring during the first, that is, the extension phase in the distal muscles controlling movements of the ankle, foot, and toes, distort the expected picture of the second, that is, the flexion phase. (c) General ether anesthesia separates the group of contractured muscles in the first phase, that of extension, from the group of muscles contracting in the second phase, that of flexion, thus explaining the unusual and distorted picture of the foot in this latter stage.

Prince, Morton. COENESTHESIA AND DEPERSONALIZATION. The patient when "depersonalized" passed automatically and independently of suggestion or external influence into several different dissociated states. In one of these there was found to be absolute and complete loss of all common, organic, vegetative, and special sensibility, but with complete normal retention of all other mental faculties which appeared to him to be keenly observable. The criteria for these judgments were not advanced. Peculiar and undescribed(?) mental and somatic phenomena were related. They were not unusual

phenomena although described by other terminae than those which Dr. Prince uses.

Ludlum, S. DeWitt. **PHYSIOLOGICAL CHARACTERISTICS OF INSANITY.** The author's paper did not deal with the medico-legal question of insanity at all. Hence his title is a misnomer. He spoke of a number of mechanically observable alterations in the X-ray picture of the intestines in some 100 patients suffering from a great variety of mental affections. He offered certain fragmentary observations tending to show a correlation between the mental status (diagnosis?) and the action pattern of the vegetative nervous system. He further endeavored to maintain that the visceral alterations were not due to emotional states. The criteria, however, of what he meant by "emotional states" were of the superficial, obvious, conscious variety. No effort was made to get into the patient's unconscious to ascertain what the real emotional status was. Hence he concluded that the psychoses were resultants of the visceral alterations—physiological, he terms them—altogether a paper with a number of observations but a one-sided irrational correlation.

Clark, L. Pierce. **SOME UNUSUAL FORMS OF PSYCHOGENIC EPILEPSY.** There are few nervous diseases which stand alone and are so unique in symptoms and pathology as to warrant our saying that they have no anomalous forms. Essential epilepsy is no exception. The signal significance of these irregular types is that they possess ethical perversions in personality-makeup which are so glaringly exposed as to overpower the picture of infrequent seizure episodes. Also, they generally have a favorable prognosis so far as riddance of the convulsive phenomena is concerned, although there are some doubts whether the ethical perversions do not continue, passing into specific and enduring antisocial deterioration. The outstanding syndrome as the basis of the unclassified type is undue and labile affectability. In most instances the seizure phenomena are not essentially dissimilar to those seen in essential epilepsy, from which it is differentiated only with the greatest of care—not upon the seizures but upon the antecedent or subsequent mental state.

Cases diagnosed as affect epilepsy in the adult frequently prove to be a psychoneurosis, a protean form of hysteria most commonly. The respiratory affect convulsions of childhood need our continued study to eliminate them from the beginnings of essential epilepsy. This task is both a pediatric and a neurologic one. The supposed occurrence of discharge convulsions in dementia precox is much rarer the more definite the syndrome of dementia precox is made. It seems unlikely that there is an association disease of dementia precox and epilepsy. The disease entity is either one or the other. True epileptic attacks are rare outside of the essential disease except in organic brain disease or as an occasional accompaniment of internal disorders (diabetes, nephritis, and the like).

Clark, L. P. **CONCEPTS RELATIVE TO THE CAUSATION OF THE PSYCHONEUROSES.** This paper was read by title. In it the author gave a summary of the preformistic or hereditary view of the indi-

vidual behavior. How does the inherited structural pattern enter into the development of the human organism in behavior reactions? Do the gametes forming the embryo at birth carry all the preformed principles of later individual development, normal and abnormal? An exposition of the functioning of the "organism as a whole" and how this physiologic view has arisen. A dynamic or physiologic concept of human behavior. A discussion of the relative rôle which the structural pattern plays as contrasted with the organismic-environmental contact in the development rôle of normal and abnormal behavior. An organism's behavior is a system of protoplasmic behavior patterns in process of adjustment to environment. How habit as a vital mode of response enters into the integration of behavior. The reconciliation of the morphologic and the dynamic or physiologic views into a broad, unitary concept of normal and abnormal behavior.

Schwab, Sidney and Smith, Groves B. CLINICAL VALUE OF INTELLIGENCE TEST GRAPHS. This paper was read by title.

Dana, C. L. PERSONALITY STUDIES AND ABNORMAL PSYCHOLOGY. This paper was read by title. In it Dr. Dana referred to the fact that there is a very great amount of treatment of the sick by lay healers, chiropractic, Christian Science, clerical, New Thought, etc. Pressure is being brought to bear on the clergy to increase its work in this line. One cannot prove that this form of activity does harm, for though this country leads the civilized world in crime and delinquency it also has a very low death rate. Nevertheless lay treatment is not a wise or rational procedure for a race. In connection with this, there is a growing interest among internists and surgeons over the psychic side and personality of their patients, a neglect of which is one factor in the prevalence of lay-healing and of the unpopularity of doctors of medicine. My paper bears on the kind of personality studies and abnormal psychology studies which would appeal to be helpful to general practitioners and surgeons.

Jelliffe, Smith Ely. NEUROLOGY AND BONE DISEASE. Dr. Jelliffe presented an abstract of a lengthy discussion of the part played by the nervous system in bone pathology. The subtitle of his paper he said was, "A Review and a Suggestion." He omitted the "Review" indicating in the broadest general way what he had attempted in this part of the paper. He had followed out the well known Hughlings Jackson level theory, that the activities of the human organism may in a general rough way be understood if conceived of as working at physicochemical, sensorimotor and psychical levels; that practically no understanding of human problems is possible unless all levels are considered.

In reviewing some of the recent work on diseases of the bone, he tried to get away from the older cellular pathology of Virchow and endeavored to rearrange the material, which is very voluminous, along some consistent plan of a neural synthesis. Thus an attempt is made to get an understanding of how bone diseases of various types come to be, dynamically. Static description is no longer of much value.

Thus, for instance, the bony changes in acromegaly are not at all understandable from the Virchow standpoint; they are not comprehensible from the standpoint of a humoral pathology—they first commence to be statable from the standpoint of a neural pathology. When thus conceived in terms of sympathetic and parasympathetic imbalance, one can understand the relative activities of dynamic principles in modifying bone structure, and not from any humoral point of view. Thus he had tried to arrange the large group of vegetative or endocrinal vegetative disturbances of the bone systems along some such consistent point of view.

Passing in this "Review" to bony changes which are well known, such as occur in poliomyelitis, in syringomyelia, in neuritis, etc., a similar point of view has offered new criteria for the understanding of these types of bone disease in which sensori-motor neural pathways are implicated.

Thirdly, in this "Review" he had tried to arrange a number of bony pathologies which may be said to be induced or more distinctly regulated by psychological factors. Thus he said that in his completed paper he had gathered a large amount of material bearing on these problems. He then turned to the *Suggestion* subtitle part of his paper, in which he gave a short report of an individual case which presented in its analysis or partial analysis, certain features which may be of interest.

Very briefly, the patient, a woman of about forty years of age, married, with two children, in comfortable surroundings, came to him after three years of illness with what was well authenticated apparently as a "hysterical" limp.

His neurological examination first revealed some minor anomalies which were not consistent with a true psychogenic picture. Briefly they were as follows; namely, that the Achilles reflex of the left side, where the limp was predominant, was slightly diminished compared with the right side, there was a slight loss of epicritic sensibility on the left side. There were no other objective indications of neurological moment.

On observing the limp, it had a very interesting character which had already been commented upon by an eminent Boston orthopedist, in that the patient "*hurried to get off of the left leg on to the right*"; she did not stay on that left leg. As she walked, there was evident distress—she perspired, or at least the face became definitely suffused, and there were manifest signs of a protopathic pain character. Not being satisfied with the previous diagnosis of a psychogenic disturbance an X-ray was made. The report from the roentgenologist was that she had a myeloma of the lower end of the tibia. Further study, however, showed there were no Bence-Jones proteids and there were no multiple voci, so that the roentgenologist who hopped at the diagnosis of myeloma retracted and a diagnosis of a benign giant cell sarcoma of the lower end of the tibia was made.

"When we arrived there, the husband said, 'Well, this is interesting: the orthopedists and the surgeons and the neurologists have

said it was a psychological condition and you tell me that it is a surgical condition. What shall we do about it?"

"Well," I said, "the surgeons all say one should be very conservative in operations on this sort of material."—I had it on the authority of Coley and a number of others. Codman in his recent investigation of this type of benign giant cell sarcoma emphasizes the conservative position. Do nothing and watch. "While we are watching," the husband said, "maybe you can help her nervousness." This condition I want also to bring into the foreground; namely, she had a very definite fine generalized tremor; all of her reflexes were very, very active; she had a partial Chvostek reaction and she was distinctly spasmophilic in her general reactions. So that was enough to say that she was "nervous" and enough for the psychotherapist to try to find out something. We agreed to make it a matter of research and leave the bone situation entirely out and watch it from time to time.

The psychological investigation revealed some very interesting things. In the very first dream that was presented for psychoanalytic investigation, the details of which are omitted, there was a very definite *wish*, speaking of that term in the *unconscious* sense, to retreat and get away from life; in other words, the very first dream contained definite suicidal trends. Then an interesting situation seemed to evolve itself as we went along into the psychological history. She had developed, and it had been persistent for many years, an interesting *sleep ritual*: As she went to sleep every night, it seemed essential before she could get to sleep, that this left leg in which the limp was located had to occupy a very definite position; it had to be *tightly adducted, the thighs compressed, the left foot raised over the right*; the toe turned in and strongly extended. She maintained this posture practically all night long. Without the posture, she could not go to sleep. Psychological investigation then directed itself as to what the ritual stood for, what the posture might mean.

After some weeks or months of study, two characteristic features seemed to appear as *determinants for the posture*. These seemed to be somewhat as follows, very briefly expressed: In the first place, the thigh had to be adducted, the vulvar orifice had to be closed, because, speaking in the language of the "unconscious," she had to reject the sex object. In other words, she had relative dyspareunia; she rejected the sex object in some degree. The second factor that showed that this apposition was necessary was that it satisfied the rubbing together of the labia in order to get a masturbatory gratification. So we had a very definite series of factors which had grown up in the course of years to determine this posture: The psychological determinants for the exclusion of the partner and for the persistence of the masturbatory thigh pressure could not be discussed in the short time.

One extremely interesting factor came up in analysis with reference to her conduct as a little girl when playing the violin, which she began to work with at about six or seven years of age; all her teachers

constantly harassed her and told her that she ought to get her left hand, which played upon the strings of the violin, over further; she never could get them over far enough, and it soon became quite apparent that in the study of the leg position, which was tightly adducted, inverted, extended, we had the exact opposite of this hand position; and it came out in the conscious history of the patient that she strove to get her hand over—and this lasted over many, many years—she noticed that her foot would turn in, that her leg would turn in, and that it made her nervous and was one of the factors which must be integrated into the story.

Pictures were shown of the bony pathological situation. Two factors were emphasized. First, the continuous pull on the annular ligaments at the lower end of the tibia due to the posture; secondly the fact that the nerve supply of this part of the bone is that of the muscles utilized in the maintenance of the posture. Thus a double series of issues are combined. Continuous periosteal irritation from pull on the annular ligament, and continuous fatigue of the nerve fibers supplying the tibio tarsal joints. The result may be interpreted in terms of a metabolic breakdown of bone—called a giant cell sarcoma.

Campbell, W. Macfie. PSYCHOPATHOLOGICAL CLINIC. The program was terminated by a series of clinical demonstrations of material drawn from the psychopathic wards.

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Moser, Ernst. SPASMS AND CONGENITAL ANOMALIES IN HIRSCHSPRUNG'S DISEASE. [Medizinische Klinik, July 1921, No. 27.]

In two cases of so-called Hirschsprung's disease muscle spasms are recognized as the cause of the obstruction located in the rectum and also of the dilatation and hypertrophy of the colon which extend from this toward the stomach. The first case is that of a twenty-seven-year-old woman who was born with imperforate anus. The restricting membrane was broken by the physician with his finger. From childhood on constipation and griping pains were present. The constipation and the pains grew worse after a confinement at the age of twenty-four. The condition grew worse steadily with edema, headache and insomnia. The woman was very ill with a marked external distention of the abdomen as a result of the distention of the colon. A membrane was found in the rectum 10 cm. from the anus with a central opening through which one could push the finger. Roentgenology revealed that 54 hours after taking the contrast picture the shadow stopped below at the left, sharply outlined with rounded bordering line. It was clear that there existed in the region of the membrane a stenosis of the colon, that is of the rectum. Because of the great weakness of the patient an artificial anus was first constructed in the region of the sigmoid flexure as a simple colostomy. Thereupon the patient recovered. But feces still accumulated between the site of the colostomy and the anal membrane. This effect of the membrane could be obliterated neither by a number of sharp incisions nor by galvanocautic treatment or separation by crushing. Even the resection of the posterior half of the membrane from behind with extirpation of the coccyx had no result. But result was first obtained by complete removal, which was undertaken after the splitting of the posterior vaginal wall. Now the obstruction of feces ceased and the artificial anus could be removed. The woman was completely recovered, was able to work and remained permanently without further trouble. The resected membrane showed a musculature arranged like a pylorus, very hypertrophic with nerves lying between. The second case was that of a six-months-old child, which at six weeks of age had suffered from constipation as the result of a cold. This soon led to an outspoken picture of the Hirschsprung's disease with the most serious distention of the abdomen imaginable. On investigation spasm of the sphincter could frequently be established. Further there

was felt in the rectum between the promontory and the syphysis a membrane of varying consistency. The portion of the bowel containing the membrane was resected. In the resected portion could be discovered neither a membrane nor a fold or valve. On the other hand, the entire muscular apparatus was enlarged mostly in the direction of the mesocolon. There was thus no membrane but only a ring-like constriction had been felt which was due to local muscular contraction. Consequently only muscle spasms were the cause of the obstruction and of the secondary dilatation of the colon, in the second case without demonstrable anatomical obstruction as in the first case with a congenital anorectal membrane. The therapy was directed to the spasm and thus brought about complete cure as Case 1 showed. The cure was so complete that not only the hypertrophy and the dilatation in the transverse diameter of the colon disappeared but also the lengthening. This was evident through the fact that the scar of the membrane reached deeply even close to the anus. An operation is not necessary in all cases in order to bring about recovery. In any case internal measures are each time to be used first especially since the results of many operations are only temporary and do not appear to be permanent. If an operation is performed the anatomical obstruction must be thoroughly removed. Internal treatment in some cases can be effective also upon the anatomical obstruction. This is borne out by a later observation. This was in a case analogous to Case 1 which has been described. Here also 10 cm. from the anus a sort of membrane with a central opening could be felt. Through repeated injections of substances which lowered the muscle tonus complete recovery was brought about in a short time. The healthy condition has lasted now for a half year. One feels the apparent membrane as a flaccid fold in the semicircumference of the bowel lumen. It is proved by this observation that in Hirschsprung's disease the spasm represents the cause, the clinical condition the illness. [Author's abstract.]

Goebel. HIRSCHSPRUNG'S DISEASE. [Mitt. a. d. Grenz. d. Med. u. Chir., 1920, XXXII, No. 4. J. A. M. A.]

Goebel calls attention to the lack of evidence afforded by the excised intestine for the cause of the dilatation and hypertrophy of the colon, and therefore considered the possibility of presence of spasms either in the muscles of the upper colon or at the anus. The first possibility is excluded by the frequent continuation of the dilatation as far as the anal ring; the second assumption is supported by analysis of a number of Hirschsprung cases described since 1906. The data show that anal spasms may occur with such severity that they may be termed analogous to those that occur in cardiac and esophageal neuroses. The reflex irritation leads to lesions of a nature analogous to those of the colon in the Hirschsprung complex; and the local spasms of the sphincter at least may be designated as a contributing cause of the colon manifestations. Treatment therefore should aim to combat the tendency to spasm.

Halley, G. L., and G. Blechmann. HIRSCHSPRUNG'S DISEASE IN CHILD. [Archives de Médecine des Enfants, Paris, August 1921, XXIV, No. 8. J. A. M. A.]

The child in question had been normal and robust until over three when he developed typical Hirschsprung's disease, with enormous dilatation of the colon. Under treatment with a purge every morning fasting (sodium sulphate, 0.5 gm.; sodium phosphate, 0.2 gm.; sodium bicarbonate, 0.3 gm.), moist heat to the abdomen, and oil enemas, the girth dropped in two weeks from 62 to 48 cm. The remarkable progressive improvement has continued since, but the prognosis is still reserved.

Gray and Reynolds. CONGENITAL HYPERTROPHIC PYLORIC SENOSIS. [Br. Med. Journ., November 26, 1921, II, No. 3178.]

This clinical paper calls attention to the possible influence of hyperadrenalism as a cause of pyloric hypertrophy. Pancreatic and biliary insufficiency also resulting from hyperadrenalism, accentuate the pyloric closure and influence the mortality. The sex preponderance is of similar importance. Gas and oxygen anesthesia are of great service in avoiding fatal operative accidents.

Keppich. EXPERIMENTAL PRODUCTION OF GASTRIC ULCER. [Wien. klin. Woch., March 17, 1921.]

An experimental study on 26 rabbits to determine whether faradization of the vagi would produce gastric ulcer. The vagi were exposed. Twelve of the animals survived the operation only a short time, and died before faradization could be employed. In these cases small suffusions were constantly found in the gastric mucosa of the fundus, but no ulcers were seen. Of the remaining 14 cases 3 had to be excluded, as the electrodes broke after the vagi had been faradized for only a few days, the animals being killed on the sixth, eleventh, and eighteenth days of the experiment. No changes in these cases were found in the stomach. In 10 of the other 11 cases ulcer formation developed. In 5 cases in which both vagi were faradized the ulcers were always of a well marked chronic character. Of the other 6 cases, in which only one vagus was faradized, in 3 the ulcer was of a chronic character, in 2 it was less marked, and in one there was no ulcer at all. Microscopical examination showed the typical appearances of chronic gastric ulcer, with small-celled infiltration and increase of connective tissue. Histological examination of the faradized nerves showed feeble staining of the vagi, indicating degeneration. Keppich has also made experiments on dogs. In one case an ulcer developed in the middle of the lesser curvature after experiments for seventy-four days, and in another case after thirty-eight days, close to the pylorus and also in the lesser curvature. All these experiments agree with observations made on the human subject in which gastric ulcer is associated with degenerative changes in the vagus. In some of these cases signs of vagus irritation had been present some time before the

gastric symptoms developed. The association between gastric ulcer and changes in the vagus has thus been found in man, and has also been demonstrated experimentally. Stoerk (Wien. klin. Woch., March 10, 1921) records the case of a man operated on for gastric ulcer of eighteen months' duration in whom the condition of the nerves in the region of the ulcer presented the appearance of an amputation neuroma.

Loeper et al. NERVOUS REFLEXIONS OF DYSPEPSIA. [Bulletins d. 1. Soc. Méd. des Hôpitaux, July 1921, XLV, No. 26. J. A. M. A.]

Loeper and his coworkers explain that as the epithelium of the stomach lining is fragile, the nerve terminals close beneath it are liable to suffer from toxic action and mechanical traction, setting up direct nervous disturbances, possibly remote, as well as by reflex action. The nerves absorb toxins and poisons, and neuritis secondary to some lesion in the gastric mucosa is common. No symptoms followed injection into the dog brain of a filtered emulsion of the pneumogastric nerve from a fasting dog, while accidents followed if the nerve had been taken from a dog during digestion. Other experiments show that the toxin absorbed by the nerve may creep up as far as the medulla oblongata. This warns that when there is a known gastric lesion, substances with an affinity for the nervous system should not be taken into the stomach. Also that existing toxins should be got rid of as soon as possible, and the digestive powers augmented. It is possible, they add, that pepsin has a direct action on the nervous system by this mechanism, instead of being merely a digestive ferment.

Hammett, Frederick S. THE INTESTINAL MECHANISM PRIMARILY STIMULATED BY SODIUM CARBONATE (ALBINO RAT). [Am. J. Physiol., Balt., 1921, LV, 414-421.]

Evidence is presented in this paper leading to the opinion that the intestinal mechanism primarily stimulated by sodium carbonate when applied to the isolated duodenal segment suspended in oxygenated Tyrode's solution at body temperature, is neural and not muscular; and that this stimulation of the segment from the normal, adult, unexcited male animal is expressed through the mechanism ordinarily mediated by the vagus, while the stimulation of the segment from excited rats is effected through the splanchnic endings or fibers. [Author's abstract.]

Magnus, R. CHOLINE, THE HORMONE OF INTESTINAL PERISTALSIS. [Die Naturwissenschaften, 1920, Heft 20.]

In this review Magnus gives the results of his own and other investigations on the pendulum and peristaltic movements of the intestines. He discusses the mechanism whereby the nervous system of the Auerbach plexus initiates rhythmic movements of the intestine, and comes to the conclusion that it must be due to a chemical stimulus. A search for the substance showed that it was heat-stable, and diffused out of the intestine into the medium in which the intestine was suspended. Further investi-

gation showed that treatment of the solution with acetic acid produced a much more active agent, which indicated that the substance had certain analogies with choline, which has been studied by Reid, Hunt, and Dale. It has been possible to isolate the substance and identify it, and it proves to be choline itself. The intestine possesses specific ferments which are able to synthesize acetyl- and pyruvyl choline when acetates and pyruvates are present, and the peristaltic action of the salts is due to this fact. Magnus points out that the extracts of the uterus act in the same way as those of the intestine. It is possible here also that the rhythmic contraction of the uterus is in part initiated by this compound. [Medical Science.]

Müller, Erik. ON THE NERVOUS SYSTEM IN THE GUT. [Upsal Läkarsällskapets förhandlingar, Bd. XXVI, h. 5-6, 1921.]

With the Bielchowsky method has the author been able to show two different kinds of nerve cells in the gastrointestinal system of the shark (*Squalus acanthias*). Both kinds of these cells are forming real nerve-nets. The first kind, that was found in the enteric musculature and the mucous membrane, consists of rounded or ovale cellbodies, solitary or arranged in small clusters and is characterized by a richly developed neurofibrillar structure. The other kind formed simple flattened branched cells, mainly to be found in the mucous membrane. Studies of the development showed that the first kind originated from the vagal ganglion. The cells migrate along the outgrowing branches of the vagal nerve to stomach and gut. The latter kind of cells originates from the sympathetic ganglia and reaches with the along the bloodvessels outgrowing sympathetic nerves to the mucous membrane where its fibers interweave. Also in chick embryos has the author been able to demonstrate the two kinds of cells. The plexus of Auerbach consists entirely of vagal cells with short dendrites and long axis cylinders. By invading cells from the sympathetic enteric nerve of Remak is in the distal part of the gut a ganglionic system formed of multipolar ganglion cells with uniform offshoots. In the enteric system of mammals the author verifies the statement of Dogiel of two different kinds of nerve cells. Considering the conditions in the shark and the chick he interprets the first cell type of Dogiel with short endrites and long axis cylinders as cells of vagal origin. The second type of Dogiel with long uniform offshoots are sympathetic cells. The author believes that these findings form a morphological basis to the enteric reflex. According to Bayliss and Starling an irritation of the wall of the gut causes a contraction above and an inhibition below the place of the stimulus. The findings in the gut of two kinds of cells different in structure and of different origin induce the assumption of two different conductory systems. Analogous to the external nervous system of the gut it is most probable to think of the vagal cells as motor and the sympathetic cells as inhibitory. The former might thus be arranged to convey the stimulus orally, whereas the latter

might conduct the inhibition caudally. In the nerve net of *Squalus* the author has been able to demonstrate how the terminal branches disappear in the musculature but also run to the epithelium. Furthermore, considering the fact that nothing supports the assumption that in the interweaving nerves of the wall of the gut the cells should be arranged to form real reflex arches, the author concludes that the reflex here is tied to the cells and their branches, in other words, that the enteric reflex is an axon reflex in the sense of Langley. [Author's abstract.]

Stoddart. MENTAL FACTOR IN VISCEROPTOSIS. [Lancet, January 14, 1922, No. 5133.]

Stoddart, whose experience has been large, for he was at one time head of Bethlehem Hospital—the old Bedlam of London, here presents a real contribution to the subject of visceroptosis. Visceroptosis is not always, possibly never, a purely mechanical affair; there are invariably dynamic factors behind it. The most important of these are unconscious psychogenic, *i.e.*, so-called emotional causes. These produce partial loss of tone or an active increase in local segmental striving in some one of the viscera or segments. The displacements are affected by unconscious processes; caused by them, or they represent compromises between anatomical structural factors and physiological psychological ones.

Nieden, H. ETIOLOGY OF ACUTE PARALYSIS OF STOMACH. [Arch. f. Klinische Chir., November 17, 1921, CXVII, No. 2. J. A. M. A.]

Nieden states that to date no one has succeeded in reproducing acute paralysis of the stomach in animals, although severing the vagus on both sides below the diaphragm is followed by stretching of the fundus part of the stomach and retarding of the evacuation, testifying to reduction of tonus. Comparison of these and other experimental findings with clinical experiences demonstrates that a nervous predisposition, especially a tendency to aparesis of the intramural nervous system of the stomach, is an indispensable factor. General anesthesia or other toxic influences, operations, trauma, mechanical overexertion, etc., are merely the occasional cause. The mortality in the latest series published keeps as high as ever, as is seen by his tabulation of the cases published since 1911, 50 per cent of the 36 cases terminating fatally. In 46.2 per cent of the fatal cases the acute paralysis of the stomach was a postoperative complication. He estimates that there are about 200 cases in all on record. He reviews 84 publications on the subject and his own extensive research on dogs, citing various typical examples. Braun has reported the case of a boy of twelve who developed acute dilatation of the stomach from reflex action as a retention catheter was applied. It slowly subsided after removal of the catheter. This occurred twice, with an interval of several months of normal stomach functioning. Legueu has reported a similar case in which catheterization of the ureter brought on the acute paralysis of

the stomach. One important practical conclusion from all this research is the warning of the danger of morphine in postoperative stomach disturbances and in acute paralysis of the stomach. Morphine promotes secretion in the stomach in addition to its other action, and hence it adds to the load the stomach is already carrying. Drugs to stimulate the parasympathetic nervous system would be theoretically indicated if it were not for this same untoward by-effect of some of them, pilocarpin, cholin, etc., that they increase the load of fluids in the stomach. He ascribes the benefit from postural treatment in part to the fact that it relieves the traction on the vagus. The relief is often so prompt and so extreme that nothing but this direct relief of the nerve from traction could explain it.

Sömjén, E. HEMOCLASIC CRISIS TEST OF LIVER FUNCTIONING. [Medizinische Klinik, October 1921, XVII, No. 40.]

This is a confirmatory clinical study of Widal's hemoclastic crisis in 82 persons. He confirms the specific connection between the positive reaction and the liver. When leukopenia or leukocytosis is observed, 20 minutes after sipping the milk, the leukopenia or hemoclastic crisis, as he calls it, testifying to inability of the liver to retain and modify the proteins brought to it by the portal vein. The leukocytes may drop by 20 to 60 per cent but this leukopenia does not parallel the severity of the liver changes. For diabetes, the test is made with 20 gm. glucose.

Kisch. HEMOCLASIC CRISIS IN CHOLELITHIASIS. [Deut. med. Woch., November 17, 1921, XLVII, No. 46.]

This is a clinical study of liver function on the lines of Widal's hemoclastic crisis tests. A specimen of blood for the purpose of counting the leukocytes was taken immediately before, and then at intervals of 20 minutes. He also determined the systolic blood pressure before the test and at intervals of 15 minutes. For a test breakfast he gave, at first, 200 gm. of whole milk, but later he increased the amount to 300 gm., which was found, in positive reactions, to bring about the hemoclastic crisis (the leukopenia) much more promptly. For comparative purposes, he employed, furthermore, at a test breakfast 20 gm. of sugar in 300 gm. of water; likewise, 500 gm. of ordinary water, with nothing added. Thirty-two patients were investigated. In 27 cholelithiasis was definite, in the others, doubtful. In 12 of the 27 positive cases jaundice had occurred, and in 15 cases it was absent. Following the ingestion of 300 gm. of whole milk (in the morning, fasting), a 26 to 44 per cent reduction of the leukocyte count was noted in 21 of 32 patients. The leukopenia reached its maximum from forty to sixty minutes after the rapid ingestion of the milk. The test breakfast of sugar solution or of ordinary water produced a reduction of leukocytes (from 25 to 32 per cent in the former and from 20 to 27 per cent in the latter) only 10 and 7 cases, respectively, from which it is evident that the 300 gm.

of milk gives more reliable results. A fall of blood pressure occurs much less rarely than leukopenia. The fact that in the presence of disturbed liver functioning leukopenia occurs following the ingestion of a non-protein test breakfast would seem to indicate that the hemoclastic crisis cannot be satisfactorily explained on the basis of anaphylactic causes.

Oddo and Borie. ORGANOTHERAPY IN LIVER DISEASE. [Presse Médicale, December 14, 1921, XXIX, No. 100. J. A. M. A.]

Oddo and Borie report the details of nine cases of liver disease, cirrhosis, jaundice during arsphenamin treatment, secondary syphilitic jaundice or catarrhal jaundice, all given treatment by 2 gm. of pulverized liver tissue daily. The digestion hemoclasia test was positive in all, that is, the constant drop in the number of leukocytes after ingestion, fasting, of a glass of milk. After six or seven days of this organotherapy, the hemoclasia test became negative, but on suspension of the liver treatment the reaction became positive anew, and could be banished again by resumption of the organotherapy. They remark that this is not only theoretically interesting but suggests the advantage of giving liver temporarily to remedy a transient insufficiency of the liver after general anesthesia or during arsenical treatment of syphilis. They advise beginning it a few days beforehand, and continuing it a few days afterward. In their experiments, the hemoclastic crisis never failed to disappear under the influence of the liver treatment in the moderate dose of 2 gm. a day, regardless of the severity of the liver disease.

Cannon, Uridil and Griffith. STIMULATING NERVES OF LIVER. [Endocrinology, November 1921, V, No. 6.]

These authors attempt to show that stimulation of the hepatic nerves will bring about an increased rate of the denervated heart. Stimulation of the hepatic nerves, they also show, causes a rise of blood pressure. It does not occur on closure of the hepatic artery and vein; it occurs on hepatic stimulation though all abdominal viscera have been removed except the liver, and, unlike stimulation of splanchnic blood vessels alone, it long outlasts the period of stimulation. None of the known or supposed products of hepatic activity—glucose, urea, catalase—when injected into the blood stream have the effects produced by exciting the hepatic nerves. Watery extracts of the liver are ineffective. Liver extracted by boiling acid and nearly neutralized augments the heart rate, but so do extracts of other organs. The efficiency of hepatic stimulation in causing a faster heart rate, when meat is being digested, it is not seen if an animal is digesting carbohydrate, or fat, or has been fed for several days on either of these foodstuffs. On the other hand, stimulation is more effective after amino-acids have been injected into the intestines. The tentative conclusion is drawn that the effects noted are probably not due to a true internal secretion produced by the liver, but to a discharge from its cells of amino-acids or amines, which are sympathomimetic in character.

Parlacecchio. VISCERAL PTOSIS. [Riforma Medica, May 1921, XXXVII, No. 21.]

This is a clinical study in which the symptoms which may be induced by sagging viscera dragging on and twisting the sympathetic nerve, with secondary malfunction of elements of the endocrine system are reviewed. The author calls attention to the observations that the clinical picture of exophthalmic goiter, without visceral ptosis, is practically identical with that induced by a sagging kidney, without goiter. This kidney may escape detection, even with radioscopy, as the kidney may slide back. Operations to correct visceral ptosis may prove brilliantly successful, he believes, in curing nervous and psychic disturbances traceable to this cause. Even if the sagging organ is not causing any disturbance at the moment, grave disturbances may develop insidiously. When mechanical measures fail to relieve, a correcting operation can be recommended. The author ingenuously tells of his own brilliant successes. In some cases three or more organs had to be fastened back in place, at one or more operations, before the final cure.

Lyon, G. TREATMENT OF MUCOMEMBRANOUS ENTERONEUROSIS. [Bull. Méd., Paris, March 5, 1921.]

The author deals in such meaningless phrases as the "treatment of the nervous soil and the reflex hyperexcitability of the sympathetic." "The motor, sensory and secretory reactions sometimes persist after suppression of the cause." [Supposed cause?] General treatment is of primary importance when the "nervous disturbance" is the main factor. A course at an appropriate watering place may prove very useful. Attacks of acute colitis require restriction to a water diet at first, with measures for coprostasis and tepid baths. Psychotherapy is conspicuous by its absence in this article.

Scheltema, M. W. CHRONIC NERVOUS APPENDICITIS. [Nederlandsch Tijdschrift v. Geneeskunde, May 1921, I, No. 22. J. A. M. A.]

Scheltema analyzes seven cases of nervous disturbances, headache, melancholia, irritability, insomnia, dizziness, habitual constipation, general weakness, poor appetite, inability to think clearly, and temperature slightly above normal at times, usually in the middle of the day—all of which subsided after operative treatment of chronic latent appendicitis.

Gabastou, J. A. UNCONTROLLABLE VOMITING OF PREGNANCY. [Semana Méd., October 20, 1921, XXVIII, No. 42.]

This penetrating article looks beyond the obvious factors. In his case vomiting had begun at about the sixth week of the eighth pregnancy, and was very persistent. There had been little vomiting in the previous pregnancies. He then made a "fake abortion." The vomiting and fetid ptialism subsiding, and the pregnancy continued its normal course. He cites a few instances of arrest of uncontrollable vomiting by a fright,

a fire in the house, etc. The author then states that the psychogenic factor in the vomiting of pregnancy must be accepted. By psychotherapy we may be able to eliminate this psychic factor, and when the influence from this is out of the way, the organism can take care of the toxic factors if there are any after the unconscious resistances are shown up.

Barrington, et al. BLADDER AND NERVOUS SYSTEM. [Collected Abstract. Medical Science.]

Micturition is the process by which the bladder normally empties itself. In the intervals between separate acts of micturition urine is retained in the bladder by the tonic contraction of the plain muscle surrounding the posterior urethra and of the compressor urethræ. Though the contraction of the compressor urethræ is stronger than that of the plain muscle of the posterior urethra (Courtade and Guyon) urine is held at the internal urethral meatus (Griffiths, Rehfish) so that the posterior urethra is closed until micturition commences. In man the posterior urethra, at any rate down to the verumontanum, can be removed without causing incontinence of urine, as is shown by the fact that this disability does not follow suprapubic enucleation of the prostate; in such cases urine is held by the compressor urethræ (Walker). In micturition there is a sustained contraction of the bladder and a simultaneous relaxation of the closing mechanism of the urethra. Both these are evident from observations on man, the first from the fact that the force of the stream is maintained nearly to the end of the act, and the second from the well-known clinical observation that a posterior urethral irrigation can be performed with a lower pressure if the patient tries to micturate voluntarily than if he does not.

The bladder derives its nerves from the hypogastric plexus. The hypogastric plexus is formed by branches of two pairs of nerves, the pelvic nerves arising from the sacral plexus and the hypogastric nerves arising from the inferior mesenteric ganglia, which in their turn are connected centrally by the lumbar splanchnic nerves with the lumbar ventral roots (Budge [1], Gianuzzi). In addition to the pelvic and hypogastric nerves the urethra receives branches from the pudic nerves, and from gross dissection it can be seen that the compressor urethræ is supplied from branches of these nerves. All three pairs of nerves are known to contain afferent as well as efferent fibers, but as their distribution is not exclusively to the bladder and urethra it does not follow from this fact that the afferent fibers in any particular case are those of the bladder or urethra. The particular nerve-roots which give fibers to the bladder vary in different species of mammal and to a slight extent in different individuals of the same species (Langley and Anderson, Sherrington), but in all species investigated the lumbar and sacral roots concerned are separated by intervening roots which contain no bladder fibers. Like other visceral nerves the bladder fibers of both the sacral and lumbar roots are interrupted by ganglion cells; in the case of the

sacral roots these are situated peripherally in the hypogastric plexus, but for the greater part of the lumbar fibers the relay takes place in the inferior mesenteric ganglia (Elliott, Langley and Anderson).

The action of the efferent nerves to the bladder and urethra. Stimulation of the peripheral cut end of one pelvic nerve causes a powerful contraction of the bladder chiefly on the corresponding side (Gianuzzi, Langley and Anderson); this result is obtained in all mammals on which the experiment has been made. Stimulation of the peripheral cut ends of both hypogastric nerves also causes contraction of the bladder, but this is weaker than that produced by stimulation of the pelvic nerves (Gianuzzi). The contraction produced by the hypogastric nerves in some animals, *e.g.*, the ferret, involves the whole bladder, but in others, *e.g.*, the rabbit, is limited to the muscle between the ureters on its dorsal side (Elliott). Relaxation of the bladder follows the initial contraction and exceeds it in the cat and monkey (Stewart, Elliott), but in no other animals have inhibitor fibers to the bladder been certainly demonstrated in the hypogastric nerves by direct stimulation. Evidence of the existence of inhibitor fibers in other animals exists from the effect of adrenalin on the bladder after the administration of ergotoxin (Elliott). Stimulation of the peripheral cut ends of the pudic nerves leads to contraction of the urethra and a similar result follows in the case of the hypogastric nerves (v. Ziesl). Peripheral stimulation of the pelvic nerves in both the dog and cat leads to relaxation of the urethra (Elliott, v. Ziesl).

The functional results of division of the peripheral nerves. (1) Both pudic nerves. This lesion in cats constantly produces some degree of incontinence which varies between the escape of a few drops only, when the bladder is gently squeezed from the outside, to the dripping away of urine when the cat is quietly walking about. The condition remains unaltered at any rate for weeks, and it is not made worse by dividing both hypogastric nerves (Barrington).

(2) Both hypogastric nerves. Micturition takes place quite normally after this lesion (Mosso and Pellacani). Incontinence of urine does not occur and urine is still held at the internal meatus and not at the compressor urethra (Barrington), showing that the contraction of the so-called internal sphincter of the bladder is not due to a nervous tone. Division of both hypogastric nerves in cats does seem to produce a certain amount of frequency of micturition (Barrington).

(3) Pelvic nerves. Division of one pelvic nerve produces no appreciable effect on micturition, but division of both nerves in dogs and cats produces retention of urine, the bladder becomes greatly distended and submucous ecchymoses, haematuria, and ulceration may occur (Lanegrace). For some days the urine constantly drips away unless some means of emptying the bladder are adopted, but during this time the animal does not show the slightest sign of distress, indicating that the efferent impulses leading to urgency of micturition must pass to the central nervous system in the pelvic nerves. This condition lasts a

variable number of days; after this time, in cats, the urine ceases to run away continuously, and therefore the animals remain dry; they carefully select spots which they consider suitable to pass urine on and squat down in the characteristic way and pass it, showing that they have a definite desire to micturate. When urine is passed, however, it is only in very small quantities and in a very feeble stream, and a large amount of residual urine is left in the bladder when they have finished (Barrington). When this stage is reached division of both hypogastric nerves has no effect on it, so that it cannot be due to the paralysis of the bladder wall having been compensated by a central nervous effect through these nerves. Division of both pudic nerves, however, abolishes this condition; urine then constantly drips away, so that the animal is always wet; it ceases to make attempts to pass urine, residual urine is always present, but in a smaller quantity than before the division of the pudics. Both the sensation of a desire to pass urine and the ability to do so, to some extent at will, in cats that have had the pelvic nerves divided, are therefore sometimes dependent on the pudic nerves. However, the sensation can only be a very insignificant part of the normal desire to micturate, since it takes the cat days to learn what it means, while the ability to pass urine cannot depend on contraction of the bladder, since the pudic nerve does not supply the bladder, and must therefore be due to relaxation of the closing mechanism of the urethra only. It may be observed that, as far as micturition is concerned, division of both pelvic and both pudic nerves is the same lesion as destruction of the sacral region of the cord, since these are the only nerves concerned which arise from this part of the cord; the effects are therefore the same as those observed in destruction of the sacral cord (Goltz [1]).

(4) Division of the sacral dorsal roots. In dogs and cats (Merzbacher, Barrington) this lesion produces retention of urine, great distension of the bladder, and dripping away of urine. The animals show no signs of distress and do not attempt to micturate, the sphincter remains tightly contracted, and the condition is permanent.

Reflex micturition. If the bladder of an intact animal is gradually artificially distended with a warm inactive liquid, sooner or later it reacts with a powerful contraction expelling the liquid. This reflex is very markedly depressed by chloroform or ether. As will be described subsequently, normal acts of micturition take place in decerebrate cats, *i.e.*, cats in which the mid-brain has been cut through just in front of the tentorium, and the brain in front of the section removed. Decerebrate cats therefore offer a means of investigating reflex micturition without the disturbing effect of anesthetics or emotions. The bladder of a cat can be divided at its neck without disturbing the branches of the hypogastric plexus to any appreciable extent; if, when this has been done, a cannula is tied into each cut end the pressure of urethral resistance and the intravesical pressure can be observed simultaneously under varying condi-

tions. In this way reflex misturition can be shown to consist of five reflexes (Barrington [3]).

(1) Distention of the bladder leads to a powerful, sustained contraction of the bladder. Both afferent and efferent paths of this reflex are in the pelvic nerves. This reflex is abolished by dividing the spinal cord or the brain anywhere behind the middle of the pons; it is also abolished by cocainizing the interior of the bladder (Shattock).

(2) Running liquid through the urethra leads to a powerful, sustained contraction of the bladder. The efferent path of this reflex is in the pelvic nerves, the afferent usually in the pudic nerves, but apparently in some cases also in the hypogastric nerves. Like the first, this reflex is destroyed by transection of the spinal cord or of the brain behind the middle of the pons.

(3) Distention of the posterior urethra leads to feeble, transitory contractions of the bladder. Both paths of this reflex are in the hypogastric nerves. The reflex is not destroyed by division of the spinal cord in the posterior thoracic region.

(4) Running liquid through the urethra leads to relaxation of the urethra. Both paths of this reflex as it was observed were in the pudic nerves; since, however, the muscle supplied by these nerves is much more powerful than the smooth muscle, the method of observation does not exclude the possibility of the other two pairs of nerves taking part in the efferent side of the reflex. The reflex is not destroyed by division of the spinal cord in the lower thoracic region, but is modified by this lesion; the modification is probably due to the abolition of a reinforcement of the reflex through the second and fifth reflexes.

(5) Contraction of the bladder provoked by distending it leads to relaxation of the urethra. The afferent path of this reflex is in the pelvic nerves, and the efferent in the pudic nerves. The reflex is abolished by cocainizing the interior of the bladder, but not by dividing the cord in the posterior thoracic region. The precise use of the third of these reflexes is not evident, but the other four are such that if one is evoked it brings the others into action in such a way that the effect of one is reinforced by another. The existence of these reflexes affords an explanation for the fact that urine is held at the internal meatus in intact animals, and at the compressor urethræ after lesions which destroy the first reflex (division of both pelvic nerves, of the sacral dorsal roots, or of the spinal cord), since the pressure necessary to force the internal meatus is greater than that which produces a reactionary contraction of the bladder.

The influence of the brain on the bladder. Stimulation of various parts of the mid- and hind-brain have been found to result in contraction of the bladder (Budge [2], Karplus, and Kreidl, Sokownin). This is not due to a general vasomotor effect, since it occurs after ligation of the abdominal aorta (Sokownin). The impulse travels down the cord and out through the sacral nerves, since it is abolished by division of the cord

or of the sacral roots (Budge [2]). Stimulation of the cord leads to contraction of the bladder, which is very much diminished by division of the sacral roots, and completely abolished if the hypogastric nerves are subsequently divided (Sokownin). Conversely, if, in a cat whose bladder is reacting with contractions to a slight increase in intravesical pressure, both pelvic nerves are divided, the contractions cease, and the bladder passively dilates and remains distended. The same effect is obtained if the central nervous system is divided at any level between the sacral region of the cord and the middle of the pons, but not if it is divided in front of this level (Barrington [3]). These effects are observed whether the hypogastric nerves are intact or divided at the time the lesion is made, and division of the hypogastric nerves after the lesion is not followed by a further dilatation, but, at any rate in lesions up to the mid-thoracic region of the cord, by a persistent contraction (Barrington).

The functional results of central nervous lesions. In the bitch from which Goltz (2) removed both cerebral hemispheres micturition not only appeared normal but the bitch squatted down in the position peculiar to intact bitches during micturition. As already stated, decerebrate cats micturate normally; the stream has the usual force, it finishes with a few jets which can be seen to be due to perineal contractions, and the bladder is empty at the end of the act; being in decerebrate rigidity, the cat remains lying on its side during the act. Micturition seems to take place rather more frequently in decerebrate than in intact cats. Transection of the spinal cord affects micturition in the same way, whatever the level, provided it is in front of the nuclei of the sacral nerve-roots, so that the pudic nerves are not interfered with. With such a lesion there is a period of retention of urine, and the bladder becomes distended and overflows as after division of the pelvic nerves. After a variable number of days the retention is succeeded by what is called spontaneous micturition. In this stage, which persists for the remainder of the animal's life, urine is only passed at intervals, and then in a series of forcible jets, the first in the series usually being the largest; in this way very considerable quantities of urine may be passed at a time. The passage of urine in jets at this stage can be easily provoked by cutaneous stimuli, especially in the perineal region, or by slight abdominal pressure squeezing a small quantity of urine into the urethra; if the cord behind the transection is destroyed, spontaneous micturition is abolished, and the bladder again continuously overflows (Goltz-[1]). Spontaneous micturition is therefore certainly due to a reflex in the part of the cord behind the transection. Since the intravesical pressure is considerable it might be due to relaxation of the closing mechanism of the urethra, to contraction of the bladder, or, as in normal micturition, to both together. The last possibility is excluded by the fact that, at any rate in cats, a considerable and usually large amount of urine remains in the bladder at the end of the escape of urine. During spontaneous micturition the jets can actually be seen to synchronize with the relaxations between clonic contractions of the perineal muscles. If

a cat in which spontaneous micturition has developed subsequent to a spinal transection is decerebrated, and the urethral resistance and bladder-pressure observed simultaneously by the method already described, the first and second reflexes described are found to be absent, and the remaining three present as immediately after the transection (Barrington [3]). Spontaneous micturition therefore is not due to any recovery of the central nervous control of the bladder improving its motility, but to relaxation of the closing mechanism of the urethra.

The term "center" has intentionally not been employed in this review as having previously been used in absolutely different senses, it would have led to ambiguity. If used as synonymous with an anatomical nucleus or as simply an expression of an experimental fact that artificial stimulation of a circumscribed region produces some effect more readily than the same stimulation elsewhere, it is correct to speak of a bladder center in the sacral part of the cord. The term when applied to a function is, however, often used to indicate that the function can take place when the center is completely separated from all other parts of the central nervous system. Used in this sense, the statement that a micturition center exists in the lumbosacral cord is false in the case of the cat and devoid of proof, or even of probability, in the case of other mammals on which the experiment of spinal transection has been performed.

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Pleschner. PHYSIOLOGY AND PATHOLOGY OF MICTURITION. [*Zeits. f. urolog. Chir.*, November 6, 1920, V, No. 3. *J. A. M. A.*]

This forty-page communication with extensive bibliography introduces an alleged new muscular element into the micturition process. It is a longitudinal muscle in the urethra which in normal conditions holds the posterior urethra open during micturition. When it is injured by hypertrophy or atrophy of the prostate, it ceases to accomplish its physiologic purpose, and this entails the disturbances in urination which accompany these prostate anomalies.

Christian, H. A. RELATION BETWEEN HYPERTENSION, MYOCARDITIS AND NEPHRITIS. [*Illinois Medical Journal*, December 1921, XL, No. 6.]

In this clinical study the author emphasizes that at the present day it is useless to speak of a single cause of hypertension. As to the mechanism, it seems pretty certain that it is caused by a disturbance in the small blood vessels, arterioles and smaller, of the body. There is observational evidence that in some patients hypertension bears some, even though an indirect, causal relation to nephritis and that both in hypertension and in some types of nephritis a lesion of small blood vessels is an important part of the causative mechanism of the processes. Very similar causative factors are operative in the production of myocarditis. In all three conditions disturbance in the small arteries constitutes an important part of the lesion but what causes the changes in the small vessels is not revealed.

II. SENSORI-MOTOR NEUROLOGY.

3. SPINAL CORD.

Gill, J. M. TUMOR OF SPINAL CORD. [Med. Jour. of Australia, September 1921, II, No. 11.]

This is a clinical report of a mid-dorsal meningeal tumor which gave a typical syndromy. Pain from pressure on the nerve roots was the initial sign. Paralysis and stiffness of the legs, loss of control of bladder and rectum with final painful muscular contractions of the lower limbs developed. Complete paralysis of both lower limbs, with flexed hip and knee joints, frequent painful spasms in each leg and sensation almost completely lost up to the sternum xiphoid line over the anterior wall of the abdomen was the clinical picture when seen by Gill. When the spines of the vertebrae were tapped this pain was aggravated and was especially acute on tapping the spine of the sixth vertebra. Operation showed tumor situated in the posterior middle line compressing the cord completely.

Lewis, N. D. C. TUMORS FROM PRIMITIVE NOTOCHORD. [Archives of Internal Medicine, October 1921, XXVIII, No. 4. J. A. M. A.]

Four cases of malignant chordoma growing from the sacrococcygeal site were studied by Lewis. In three cases there was no suggestion as to the etiology. In one case there was a strong probability of injury. Judging from the variety of diagnosis made in these cases by as many competent pathologists and surgeons, Lewis believes that these tumors are much more frequent than was formerly supposed, and they have undoubtedly occasionally been classified among the other forms of malignancy. Malignant chordoma may be considered as causing 100 per cent mortality. Because of the extensive infiltration of the regional fascias, and the difficulty of early diagnosis, operative treatment probably rarely effects a cure, but excisions of the principal tumor mass, and intestinal resections have been beneficial in the removal of pressure and pain phenomena.

Elsberg, Charles A. THE FALSE LOCALIZING SIGNS OF SPINAL CORD TUMOR. [Am. Arch. of Neurol. and Psychiat., V, No. 64.]

Some cases of spinal cord tumor where the signs and symptoms at repeated examinations point to the localization of the tumor at a certain level, the growth may be found in quite a different position. Elsberg here describes two cases in which these "false localizing signs" were present. The first was in a woman with an extramedullary growth at the seventh thoracic segment; laminectomy involving the fifth to the ninth thoracic vertebrae was fruitless. Three and a half years later indications of a tumor at the seventh or eighth cervical segment seemed inferable. At the operation an endothelioma about 2.5 cm. long was

removed from the posterior surface of the eighth cervical segment. In the second case operation failed to disclose an expected tumor at the eleventh thoracic segment. Seventeen months later an extramedullary fibroma was removed from the fourth thoracic segment. Another fact which has impressed the author is the frequency with which tumors in the cervical region produce symptoms in the lower extremities only. He also points out that in rare instances a tumor on one side may so press the cord as to cause symptoms referable to the opposite side. For example, with indefinite Brown-Séquard symptoms, the greatest motor loss may be on the opposite side, and the greatest sensory disturbance on the same side as the tumor. Similarly, a growth on the anterior side may cause symptoms suggestive of a posterior growth. Lastly, in five cases of thoracic tumor of an expanding nature, Elsberg found tingling or hyperesthesia in the fingers of one or both hands. Since in one of these much fluid under pressure escaped from above the tumor, he suggests that the finger disturbance was due to affection of the posterior roots by the column of fluid above the tumor.

Redlich, E. SPINAL CORD TUMORS. [Med. Klinik, October 30, 1921, XVII, No. 44.]

In this clinical discussion the author speaks of the marked preponderance of malignant to benign tumors of the cord ten to one. Serous meningitis and multiple sclerosis are the most frequent conditions causing a tumor syndrome. If the tumor shuts off the brain, the spinal fluid below contains an excess of albumin and globulin, but the cell count is usually normal. The fluid may be yellow and may coagulate. Tumors in the cauda region show this frequently. A simple increase in the albumin content speaks for a tumor higher up. Compression from a tumor is often diagnosed by the abnormal pressure in the fluid when the head is bent over. The removal of a tumor is generally borne well. In one case the patient died two days after removal of a large glioma. He now prefers operation in two stages.

Bolten, G. C. PRIMARY TUMORS OF THE SPINAL DURA MATER. [Nederl. Tijdschr. v. Geneesk., 1921, LXV, August 20, 1030.]

Bolten reports two cases of primary tumors of the spinal dura mater to a meeting of South Holland neurologists: these cases are fairly common. These tumors comprise fibromas, lipomas, sarcomas, lymphomas, angiomas, endotheliomas, as well as granulomas and cysts. The sarcomas are specially noteworthy: some of them are firm with a definite limit, of the size of a hazel nut, while others are soft, lax, pappy masses that cannot be wholly removed by the knife but have to be scraped away by a sharp spoon in fragments. These sarcomata behave like innocent tumors, they do not invade surrounding tissues and recurrences do not occur even though complete removal (at any rate of the softer form) is impossible. But the vertebral sarcomata behave like malignant tumors. These primary spinal dura tumors occur mostly

on the dorsal surface of the lumbar swelling: they may be either extra- or intra-dural. Operation is very favorable, and the wound heals readily. Diagnosis is usually easy: we have a slowly progressive transverse lesion without any tendency to upward extension, without acute onset or fever or other general symptoms. Usually the first symptoms are sensory: paresthesia, then root-pains, the motor paresis passing into paralysis with partial R. D., then bladder and rectum disturbances, and finally complete sensory palsy; with this there is usually an almost complete a-reflexia. There is generally great tenderness on pressure over the affected vertebra. There is xanthochromia of the spinal fluid, spontaneous coagulation, with strongly positive Nonne reaction, and no pleocytosis. [Leonard J. Kidd, London, England.]

Kleinberg. FRACTURE OF SPINE. [Journal of Bone and Joint Surgery, January 1922, IV, No. 1.]

The prognostic insecurity attendant upon most spinal fracture cases is here discussed. At present there are no certain methods of knowing whether the neurosyndromy results from irreparable damage, a removable obstruction, or to conditions which will be relieved by conservative treatment. The safe procedure is early laminectomy, as soon as is wise for the safety of the patient. The author modifies this formulation as follows: (1) Motor and sensory symptoms disappear in many cases under rest and immobilization. (2) Decompression laminectomy is often not followed by relief. (3) The mortality from laminectomy for spinal fracture is considerable, hence it is difficult to advise laminectomy invariably in fractures of the spine, with nerve symptoms, without waiting to observe what rest and efficient support may give.

Work. MULTIPLE DIVERSE TUMORS AFFECTING SPINAL CORD. [Col. Med., February 1922, XIX, No. 3.]

A clinical paper reporting the findings in a complicated condition in the spinal cord. The case showed the symptom of an extramedullary tumor. The history was of some duration of nonincapacitating symptoms with some operative relief. Two lesions, one epidural, the other subdural were found, which microscopically were different as to their pathology. The epidural growth first removed was a mass of yellow connective tissue, a fibroma. The other tumor was a cyst with a firm and dense wall somewhat calcified as in the osteomata.

Sicard and Forestier. CHRONIC LUMBAGO. [Presse Méd., January 18, 1922, XXX, No. 5. J. A. M. A.]

Sicard and Forestier refer to chronic rheumatismal pain in the lumbar region with negative roentgen-ray findings, rebellious to the usual measures, in cases in which tuberculosis, syphilis, the gonococcus, post-typhoid spondylitis, and cancer metastasis can be definitely excluded. In five cases described, the pains had dragged along for several years, incapacitating the patients, but without sphincter disturbance. The vertebral

muscles are stiff and the patient stoops; this does not occur with disease of the spinal nerve roots, as in tabes and zona, no matter how severe the pains. The seat of the process causing the lumbalgia is in the funiculi, not in the nerve roots. This assumption was confirmed by the cure after laminectomy. The aspect of the epidural space in one case is illustrated, showing a series of five grooves in the fatty tissue. They smoothed out after the operation. In all cases of funiculitis from any cause, the muscles of the spine are stiff. This in itself differentiates funiculitis from radiculitis, and removal of the laminæ of three to five vertebræ has always relieved the funiculitis by opening up the intervertebral foramens, and resulted in a permanent cure.

Lhermitte and Pagniez. INJURY OF SPINAL CORD. [Presse Méd., January 21, 1922, XXX, No. 6.]

A clinical report of a case of an apparent complete transverse section of the cord in the lumbar region which took place at the age of three. Complete paraplegia had resulted, but both legs had grown proportionately in length, although atrophied, with equinus deformity of both feet. The bladder and rectum had recovered a fair degree of functioning. Although the lumbar and sacral portions of the spinal cord had been destroyed, the boy's development at thirteen was such as to lead the authors to question certain generalizations now current in neurology relative to the importance of certain spinal synapses.

Fischer, O. CONTRIBUTION TO THE PATHOLOGY AND THERAPY OF TUMORS OF THE SPINAL CORD (ROENTGEN THERAPY. TUMOR CELLS IN FLUID. ARRANGEMENT OF THE SENSORY FIBERS IN THE LATERAL COLUMN. SIGNIFICANCE OF THE ABDOMINAL REFLEXES.) [Zeitschr. f. d. ges. Neur. und Psych, Vol. LXXVI, Nos. 1, 2.]

Fischer makes a report of the findings as well as of the effect due to the employment of X-rays in spinal tumors. In two cases of metastases of malignant tumors in the spinal cord with severe symptoms upon application of the rays there were revealed most markedly alterations of the tumor cells found in the fluid and also the syndrome of blocking disappeared. Both patients, however, died as a result of a severe decubitus which showed itself after 24 hours. Central trophic disturbances were assumed. At times also the application of the rays produced a temporary increase in the disturbed neurological condition. In two other cases there was improvement, practically recovery, without the occurrence of the trophic disturbances. In one case of hypernephroma of the vertebral column which had penetrated the dura only in one small spot the application of the rays revealed the tumor cells in the fluid. In still another case where there was a glioma of the posterior cranial fossa death succeeded an acute swelling 14 hours after the application of the rays. Still another observation confirmed the diagnostic value of the tumor cells in the fluid. They indicate a histologically

malignant tumor which at least partly has penetrated the meninges and which cannot be extirpated. Here roentgen therapy should be considered.

The sensory disturbances observed in one instance revealed themselves as not segmentally located but in limited zones ring-like in form. The author therefore infers that the lowest portions of the fibers of the lateral columns which supply the lower extremities lie most exteriorly, those for the upper portions further within. The fibers which lie together are arranged according to the articulations not according to the root segments. He finds that notice has been taken of this in the literature, that a regrouping of the second sensory neuron has taken place already in the spinal cord with such an arrangement as seems to prevail in the cerebral center. Clinically there is evidence of the separate course of the heat, cold and pain tracts. In two cases, apparently of tumor at the level 5 D, there was failure of the upper abdominal reflex, injury of the 5th and 6th thoracic bodies, with this, upper abdominal reflex +, middle varying, lower 0, both lateral columns surely injured. Thus the mere failure of the lower abdominal reflex is not decisive as to a localization in the inferior dorsal region. It would seem that the dissociation of the abdominal reflexes in a lesion of the lateral columns cannot be explained without accepting the separate fiber tracts. [J.]

Stewart. MALIGNANT SACROCCYGEAL CHORDOMA. [Journ. of Path. and Bact., January 1922, XXV, No. 1. J. A. M. A.]

Stewart records a case of malignant chordoma (chordocarcinoma) of the sacrococcygeal region and reviews the literature on the subject. The present case is said to be the twenty-sixth chordoma of clinical interest on record, and the ninth example of a sacrococcygeal tumor of this kind. A man, aged sixty-five, had a slowly growing solid tumor over the coccyx, which in eight years had attained the size of an orange. It was excised and histologic examination showed it to be a typical malignant chordoma (chordocarcinoma). After five years a disseminated mass made its appearance in the left buttock, and about three years later a nodule appeared over the right scapula. These masses also grew slowly, but while the latter tumor remained discrete and well encapsulated, the former ultimately caused great destruction of the femur and iliac blade. The patient died eleven years after the excision of the primary growth, and no evidence of general dissemination was found postmortem.

Dejerine and Ceillier. PARA-OSTEO-ARTHROPATHY. [Médécine, February 1921.]

This interesting group of new growths about the joints following war injuries to which those authors have called renewed attention is here discussed on the base of 11 cases. In half of these paraplegics, these osteoarthropathies had developed—a large proportion.

Harbit, Francis. TUBERCULOSIS OF SPINAL CORD WITH PECULIAR CHANGES. [*Journal A. M. A.*, February 4, 1922.]

The clinical picture of the case reported by this investigator suggested poliomyelitis; but the meningitic phenomena were more marked than usual in this disease, and the course pointed to a tuberculous process. At necropsy there were found caseous tuberculous lymph nodes in the hilum of one lung; a small cavity in the apex of the left lung surrounded with some small tubercles; scattered miliary tubercles in the spleen, a single caseous focus in one kidney; tuberculous meningitis at the base of the brain, and a tuberculous spinal meningitis of unusual distribution. The dura over the entire cord was adherent to the leptomeninges by fibrinous exudate, and the leptomeninges were infiltrated with a fibrinopurulent exudate throughout so that the cord and its membrane filled the canal completely. On the cut surfaces in various parts of the cord there was no evident separation between the meninges and the cord substance, which was swollen, soft and edematous, the substance flowing out over the cut surface. The distinction between gray and white matter was indefinite, the horns being barely recognizable. From the membranes, injected streaks passed into the substance of the cord. In the cauda equina there was much exudate and there were also tubercles.

Todd, T. W. POSTURE AND CERVICAL RIB SYNDROME. [*Annals of Surgery*, January 1922, LXXV, No. 1.]

This interesting communication from one who has made an extensive series of studies of cervical rib is worth recording. He maintains that it is possible to produce, experimentally, a syndrome like that of cervical rib syndrome. Just what conditions are necessary will be found on consulting the original.

Cumming, R. E. SHELL FRACTURE OF SPINE AND CHANGES IN KIDNEY AND BLADDER FUNCTION. [*J. A. M. A.*, February 4, 1922.]

A further report is made by the author as to the end-result in a series of twenty cases of shell fracture of the spine reported on by Plagge-meyer in 1919; and nine other cases are added. In most of the cases, since the injury, there has been no return of the reflex nervous control of the bladder. From the neurologic standpoint, in general, there has been decided motor improvement, and less, if any, sensory improvement. In several cases partial sex function return is recorded. All except a few patients have recovered good general health, even though they may not have excellent kidney function. In the fatal cases, the patients died early in the course of their disease, in every instance from kidney infection and uremia. In all except one case, the bladders have retained the changes developing subsequent to the injury. Each patient carries a small amount of residual urine. In no case has there been infection late in the progress; also, other complications have been avoided, owing

to avoidance of catheterization as far as possible. Use of the sinusoidal current for bladder stimulation was apparently efficacious for a time, but in two cases serious complications developed. Of supreme importance to the patients themselves, their general condition has improved to a point at which they are ambulatory, enjoying life to a degree seemingly impossible. Their bladders have taken on the automatic state, with which they can be entirely comfortable. Hyperhidrosis, a constant finding in these cases, has persisted to a varying degree. All trophic ulcers have healed.

Thorburn, W. INTRATHECAL TUMORS OF SPINAL CORD. [Brit. Med. Journ., January 14, 1922, I, No. 3185. J. A. M. A.]

Thorburn pleads for greater care in the diagnosis of intrathecal tumors of the spinal cord because early removal leads to recovery, at least consistent with comfort if not complete recovery. He also urges the great importance of exploring doubtful cases of transverse lesion of the cord—that is to say, all cases which are not obviously hopeless. One is more likely to do good than harm should a diagnosis of a thecal tumor prove incorrect. Thorburn holds that there is a strong probability that many early cases of transverse myelitis may be arrested and cured by incision and drainage of the dura mater—a possibility fully in accord with the view held that such myelitis is often due to infection spreading along the spinal nerves and then necessarily crossing the meninges and the intradural space before the cord itself is attacked. If this view of the causation of transverse myelitis be correct—and there is strong evidence in its favor—one may hope to arrest the infection in its course and save the cord before it is irretrievably damaged. Thorburn also is of the opinion that the infections usually come from the urinary organs.

Japiot, P. SACRALIZATION OF THE FIFTH LUMBAR VERTEBRA. [J. de radiol. et d'électrol., 1921, V, 145. Med. Sc.]

Sacralization of the fifth lumbar vertebra is of importance because of the part it plays in lumbosacral neuralgias and sciatica of unknown cause; it is found in a considerable number of cases when care is taken to look for it. It may remain latent or may be revealed by a simple scoliosis, but more frequently gives rise to pain, usually when the subject is between twenty and thirty years old, generally as a result of trauma. The pain varies much in different subjects, and often simulates an affection of the urinary system. Some clinical signs may lead one to suspect the condition, but the X-rays are the only certain methods of diagnosis. A description of the technique and the various normal appearances of the fifth lumbar vertebra are given; to obtain a correct image of the bone and its relations with the neighboring bones it is necessary (1) to center correctly on the vertebra and to place the pelvis as symmetrically as possible, and (2) to take several negatives in case of doubt from various angles of incidence. Between the normal

and complete sacralization there are many stages: in many cases the radiologist can only point out abnormalities in the bone, but he can state that sacralization is present (1) when the transverse processes are clearly asymmetrical because of the hypertrophy of one of them, (2) when there is contact between the transverse process on the neighboring bones. A description is given of the various ways in which sacralization can occur.

The diagnostic value of the radiograph. In some cases the X-ray plate aids diagnosis, but more often it is the only positive sign. It is of great use in eliminating Pott's disease of the lumbar vertebræ. The author then describes two of his cases.

Radiotherapy of painful sacralization. The Americans believe in a mechanical origin of the pain, and have practiced resection with some benefit. The Italians believe more in irritation due to compression of the fifth lumbar nerve and traction on the corda equina, and have tried to act upon this latter part by radiotherapy. The author has treated four cases by radiotherapy with good and rapid results, which leads him to think that, although the treatment of this condition is in its early stages, radiotherapy should be continued.

Paulian, D. E. SPINAL CORD TUMOR. *Bulletins de la Société Médicale des Hôpitaux*, June 1921, XLV, No. 20.]

In this communication the author emphasizes the diagnostic importance of the zone of hypoesthesia just above the zone of anesthesia, in the presence of compression of the spinal cord from a tumor. Above zone anesthesia there is a pronounced hypoesthesia, still above this is a slight hypoesthetic area. The upper and lower limit of the zone of pronounced hypoesthesia corresponds, he has found, to the upper and lower limit of the pressure.

BOOK REVIEWS

Taylor, Henry Osborn. GREEK BIOLOGY AND MEDICINE. Our Debt to Greece and Rome. Editors, George Depue Hadzsits, David Moore Robinson. [Marshall Jones Company, Boston, 1922.]

Osborn has opened his delightfully appreciative study of the exponents of progress in Greek biology and medicine with certain words which give the key to the character of their work. They explain also why our minds are so refreshed by this presentation of the work and of the lives of the men which the work reveals. Osborn says that these dwellers in the Ionian cities on the coast of Asia Minor and elsewhere were blessed with lively intellectual curiosity. They were free from political or religious slavery. "Men might think as they saw fit upon the origin and order of the world, and freely express their opinions." Osborn then proceeds to show the heritage which biology and medicine have received from such a background. He sets forth the work in some detail of the representative leaders of investigation and of their use of hypothesis with experimental investigation. He traces progress through Hippocrates and his followers or those who departed in some respects from him, reviews Aristotle's contributions to zoölogy and to philosophical interpretation of biology and from him follows the history of medicine to Galen. He sets forth the prodigious character of this man's work in which he finds its great contribution to thought and practice but also the evidences already of those things which were to close down for a long time upon progress in the science of medical research.

The book will not only enlist the interest of the trained as well as the lay mind, but its own appreciation of the fundamental vitality of the spirit of these early investigators gives fresh incentive to the same elements of inquiry which the modern and the ancient mind share alike. In the Greeks these qualities were not suppressed ones and therefore the stimulus of the Greeks to us.

Newman, Horatio Hackett. THE PHYSIOLOGY OF TWINNING. [The University of Chicago Press, Chicago, Illinois.]

Newman has followed his previous study upon the "Biology of Twins" by this work which brings amplified corroboration of the theory there set forth by him. He feels himself justified through the consideration he has given to the subject in asserting his claim to authorship of the theory. He follows the phenomenon of twinning through such widely diversified forms as echinoderms and man to prove that twinning is a much more common phenomenon than one would at first believe. It is to be distinguished from polyembryony,

which is a different process. Twinning is a dichotomy, literally a "twaining" or "two-ing" to be explained upon the retardation of the process of development at any point where the axial gradient is lost and where with revival of the conditions of growth a new gradient is established. Usually enough of the original axis of polarity remains to permit two favored points to become the new apical points for the twin embryos. This theory admits the inclusion of perfectly symmetrical twins, of double monsters or of twinned organs as examples of the same phenomenon. It explains also *situs inversus viscerum* and mirror-image symmetry. In relation to these phenomena the author discusses the dangers which lie in twinning for the human species and the manner in which such dangers are sometimes successfully overcome. He suggests a new classification of the modes of reproduction on this theory under the divisions axiate and nonaxiate reproduction, a classification which keeps the processes of transverse fission and budding distinct from true twinning. A common feature of all modes of reproduction significant biologically and interesting for psychologic analogy is the tendency for independent development as soon as the integrative forces of the organism begin to weaken.

Miller, H. Crichton. THE NEW PSYCHOLOGY AND THE TEACHER.
[New York, Thomas Seltzer, 1922.]

This book presents many points of view which should set the teacher thinking of his task from the dynamic aspect both for himself and for his pupil. It gives many practical principles in the interpretation of the problem of teaching and of the mental lives of those whom the teacher should aid in self-development. Yet the book imposes upon the reader that oppressive sense of the evasion of fundamentals which arises from similar writings which base themselves upon the assumed superiority of "analytical psychology" over psychoanalysis. The author is right; there are irreconcilable differences between the two and his own writing tends to increase this irreconcilable difference. Miller shows in theory and from his own practical work with dreams and other mental mechanisms which he discusses how many excellent conceptions Jung and his followers are developing. But these too often float unattainably out of reach of the more individualistic difficulties that block the efficiency of lives. In fact the idealization frequently brings the conceptions so out of line with detailed reality that they are misleading. The often repeated criticism that Freud's psychoanalysis lacks relation to development in the direction of progressive ideals, takes no account of social relations, this author says reveals two things. One is ignorance, self-protective one suspects, of Freud's theory and practice; the other grows out of this, namely, refusal to follow into the fundamental, concrete analysis of the facts and mechanisms of the mind. This gives the book its unsatisfactoriness which overweighs the valuable matter that is in it. It also tends to make the writing less clear than it might be. One cannot help contrasting this with the painstaking perspicacity of Freud's expositions.

Benedek, Ladislaus and Porsche, Franz Oskar. ÜBER DIE ENSTEHUNG DER NEGRISCHEN KÖRPERCHEN. Abhandlungen aus der Neurologie, Psychiatrie, Psychologie und ihren Grenzgebieten, No. 14. [S. Karger, Berlin, 1921.]

The authors' brief treatise presents an enlightening study of the negroid bodies. It does not accomplish this by arriving at positive final conclusions but rather it opens wider at every point the question as to the nature and origin of these bodies in a manner which invites to further study. The authors review the history of the discovery of these bodies and the progress of investigation since their demonstration by Negri in 1903. The discussion of their own methods of investigation through certain definite staining processes is interwoven with a comparative review of the work and the opinions of other investigators upon these same formations. The authors' own conclusions tend not to the theory that these bodies are parasitic in nature which others have believed but to the theory that they arise out of structural changes in the nucleolus dependent upon the cell vitality which resists the invading toxin of rabies.

Stekel, Wm. TWELVE ESSAYS ON SEX AND PSYCHOANALYSIS. Translated and edited by S. A. TANNENBAUM. [The Critic and Guide Company, New York.]

To the serious student of psychopathology, one of whose technical methods of investigation is called psychoanalysis, there is a definite irritation at the title given to these really excellent essays.

Psychoanalysis is a technical method for studying foundation principles of human behavior. Such foundation principles imply the study of life processes and as such the reproductive instinct is intimately bound up in all life's reactions.

Sex, however, is not its field in the sense in which this title would seek to convey, any more than a book on the migration of seals, which migration is fundamentally related to the race propagation instinct, should be entitled *Sex and the Migration of Seals*. *Sex and the Color of Flowers*, *Sex and the Manufacture of Lip Sticks*, *Sex and the Auto Industry* would be just as silly titles as is the title of this work.

Having made our protest at the title we can commend the essays. Like most of Stekel's writings they are very discursive and much too dogmatically presented. With Stekel, especially in his earlier writings, a thing is "always so." Hence he must be read with caution. When such reservations are held in mind Stekel can be read with much profit. He is always stimulating and opens up new vistas for thought and investigation.

Turner, Julia. THE PSYCHOLOGY OF SELF-CONSCIOUSNESS. [Moffat, Yard and Company, New York.]

An interesting little book, full of chunks of undigested material, with terrible terminological wrappings, hardly worth the time and effort of untying the packages and seeing what they contain. In saying this we are not unmindful that the author herself provides a

glossary to aid us in this procedure. This glossary, however, is more of an index than an explanation of her vocabularial eccentricities.

Opening up a few of the author's bundles we find all kinds of misalliances, contradictions and turgid realities. We are told the "animal has no self-conscious," yet *he* also, like the "human," experiences "fear." Fear of what: "himself" or what? (p. 3-p. 204). Sometimes we think we understand what is being said and the next moment we are sure we need to know more about the writer in order to comprehend her deductions. When we enter the East, West, North and South Gates, appendix by Theresa Gosse as an "Illustrative Exercise," we are sure we need Elmer Earnest Southard to help us. In fact—we need a lot of departed shades to aid us.

On the whole, the chief value of this book is to teach neuro-psychiatrists to go right on observing human behavior and let the outsider, who seems to know little about it, write books, with the hope that when they get it out of their systems they will be in a position to really learn something about it.

Kretschmer, Ernst. MEDIZINISCHE PSYCHOLOGIE. Zweite verbesserte Auflage. [Verlag von Georg Thieme, Leipzig. \$1.20.]

The first edition of this valuable small volume was reviewed in our columns but a short time ago. This edition, somewhat enlarged and gone over with care, gives us in a small and compact compass, a practical psychology for students of medicine. It has psychiatric experience behind it and this gives it a practical aspect decidedly lacking in the more academic psychologies, whether written from the "newer" psychoanalytic angles, or from the "older" intellectual aspects.

It is a psychology in which feelings, instincts, temperaments, personalities, and reaction types are emphasized, rather than one in which sensations, intellectual concepts, and diffuse discussions of perceptions, cognitions and other really nonessentials are bound together by many words.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

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ORIGINAL ARTICLES

TWO CASES ILLUSTRATING THE PATHOLOGICAL AND PSYCHIATRIC ASPECTS OF CARCINOMATOUS METASTASES IN THE CENTRAL NERVOUS SYSTEM

By M. E. MORSE, M.D.

OF BOSTON, MASS.

Metastatic carcinoma of the nervous system occurs in two forms, as scattered nodules in the brain substance and as involvement of the meninges without invasion of the brain tissue. The first type is comparatively common; the second is rare. An example of each form is reported in the present study.

From a clinical standpoint it is important to recognize metastatic cancer of the nervous system. When the primary tumor is evident, the diagnosis can usually be made with a fair degree of probability, but when it remains latent, or its presence is unconfirmed, it may be very difficult or even impossible to make a correct diagnosis.

The first of the two cases here described was one of primary carcinoma of the lung which remained latent throughout its entire course and was discovered only at autopsy. The first definite manifestation of illness was the sudden onset of cerebral symptoms, which presented an interesting problem in differential diagnosis. The invasion of the nervous system was of the rare form, a diffuse involvement of the meninges. This was not apparent at autopsy and was revealed only by the microscope.

The second case is less unusual than the first, but is presented chiefly for purposes of comparison. The patient, who had an inoperable carcinoma of the breast, suddenly developed cerebral symptoms, ushered in by convulsions and followed by a delirious state. The cerebral metastases in this patient were in the form of massive nodules in the brain substance without involvement of the meninges.

The cases in detail are as follows:

Case I. C. W. S., male, aged fifty-five. Chef. His past history had no bearing on his present illness. His health had always been good and his habits regular. He denied venereal diseases and the use of drugs.

Present Illness: For four months before the onset of the more marked clinical picture he had been complaining of fatigue and frequent headache, usually frontal. He had lost eighteen pounds over a period of a few months. He also consulted a doctor for pain in his right shoulder.

On September 30, 1921, while at work, he had what was described as a "stroke," apparently a period of confusion lasting a few minutes. He was found wandering about, disoriented for time, place and person. There was also a left facial paralysis, which, however, cleared up in two days. There were no visual symptoms and no headache at that time. The next day he became delirious and remained in that condition, with brief intervals of clearness, for the next three weeks. The affect was one of fear. On October 5 vomiting set in, without much nausea, and on October 7 severe headache all over the head. Temperature normal. Systolic blood pressure 125. Heart negative. Urine normal. Wa.R. negative.

On October 21 he was seen in consultation with Dr. C. Macfie Campbell. At that time he was very confused and recent memory was extremely poor. He did not at first recognize the family physician and was entirely disoriented for time. There was no grandiose trend.

Neurological examination showed the pupils reacting sluggishly to light but well on accommodation. The discs were both a little indistinct on the nasal side and the vessels tortuous and sclerotic. Slight von Graefe. No hemianopsia. No aphasia. Test phrases very poorly done. Knee jerks present and equal. Left Achilles absent. Plantar reflex normal on both sides. Abdominals normal. No tremor or muscular weakness. Slight tenderness of the calves.

The diagnoses considered were: neoplasm; lethargic encephalitis; abscess; paresis; and arteriosclerosis.

On October 23 the patient was admitted to the Peter Bent Brigham Hospital.* He was then entirely disoriented for time, place and person, and did not coöperate or answer questions. At the time of the examination he was having visual hallucinations, seeing ships on the wall. He was continually moving about in bed, pulling the clothes, rubbing his face, and yawning.

Physical examination showed a fairly well-nourished man. The face was flushed, eyes bloodshot, and tongue very red, dry, and beefy. The pupils were 3 mm. in diam., regular, and reacted to light and on accommodation. There was no extraocular palsy, ptosis, nystag-

* The writer is indebted to the Peter Bent Brigham Hospital for the use of the clinical and autopsy records in this case, and of the clinical record in the second case.

mus, or exophthalmos. The tongue was protruded slightly to the left, without tremor.

The cervical, axillary, and epitrochlear glands were not felt.

Expansion of the chest was good and equal, and the lungs were resonant throughout. The breath sounds were vesicular and there were no râles.

The heart was normal. Blood pressure 160/80. Nothing abnormal was made out in the abdomen. Neurological examination gave the same results as previously.

On October 24 the patient was seen by Dr. Harvey Cushing, who made the note that "the fundi show marked tortuosity of veins and some edema. The cup is filled; lamina not apparent. Patient is quite disoriented, rambling and inconsequential in speech; much like a patient in febrile delirium. He smiles inanely and makes efforts to talk. Kernig's sign is present at 90°, with marked discomfort."

Stereoscopic plates of the skull in the right lateral position showed the skull normal in contour with normal sinuses. There was no evidence of increased intracranial pressure. The sella was normal. The patient complained of constant frontal headache and vomited each morning after breakfast.

On October 27 a more definite swelling of the disc was evident than at any time previously. The nasal margins were practically obliterated and the temporal margins hazy. The disc was slightly injected and the cup filled in. The veins were swollen and tortuous.

On October 29 Dr. Cushing noted a little nystagmus to the left and a little tenderness in the left suboccipital region; also a very definite wavering of the left hand in the finger-to-nose test. These signs increased the next day. The patient complained of dizziness on standing or sitting, and had difficulty in supporting himself in his chair. Romberg's sign was present, with falling backward, and the gait was staggering. There was marked dysmetria in the heel-to-knee test on both sides. Supination-pronation was poor. There was slight facial weakness on the left.

On November 2 patient was in a state of delirium alternating with dullness. Speech was unintelligible and he apparently had marked difficulty in using his tongue. He coughed or vomited when swallowing fluids. The left hand was moved with less dexterity than the right. On the fifth of November it was noted that the lungs were free from râles. On the sixth the patient suddenly developed bronchopneumonia and died on the eighth.

Autopsy revealed a carcinoma of the lung with metastases to the brain, adrenals, liver and bronchial lymph nodes. Only the findings of immediate interest will be described here. On opening the chest, small nodules, 4 mm. in diam., were at once seen and felt, studding the visceral pleura, the parietal pericardium, and to a less extent the parietal pleura. The lymph nodes at the hilus were involved. The left pleural cavity contained 300 c.c. of blood-tinged fluid. The lungs were uniformly and thickly studded with hard gray nodules, 4 mm. in diam. At the posterior aspect of the left lower lobe the

pleura was puckered in toward the hilus, and on cutting the lung at this location a gray tumor mass 7 cm. in diam. was brought into view. Some pus could be forced out of the bronchi on pressure.

The liver contained twenty nodules, the largest 1 cm. in diam. The glands around the coeliac axis were involved. The aortic and pelvic nodes were free from metastases. The medulla of each adrenal was replaced by a firm gray growth 2 cm. in diam.

The dura appeared normal. The pia also showed nothing in the fresh state, although after hardening the brain formalin a diffuse haziness was visible. On the floor of the fourth ventricle at the margin of the posterior medullary velum there was a firm white nodule 1 mm. in diam. and a similar one 5 mm. in diam. on the surface of the caudate nucleus and extending inward about 3 cm.

Coronal sections of the brain showed the following metastases: in the left occipital lobe a tumor which extends from within 2 cm. of the inferior lateral aspect of the occipital pole forward for a distance of 5 cm. Its greatest diameter is 3 cm. Section about 1 cm. posterior to the fissure of Rolando and approximately through the center of the temporal lobes, exposes three small metastases, each about 1 cm. in diam., lying just beneath the cortex, one on the left side immediately above the Sylvian fissure, the second on the right side 1 cm. lateral to the superior longitudinal fissure, and the third in the right temporal lobe just below the Sylvian fissure. The cord showed nothing noteworthy macroscopically.

Microscopic examination of the primary tumor in the lung shows a very cellular neoplasm of alveolar arrangement with some papillary projections into the lumina. The tumor cells are columnar and resemble closely the epithelium of the smaller bronchi, except that the latter have cilia. Mitotic figures are fairly numerous, although less abundant than in the metastases. The tumor is replacing the epithelium of the alveolar walls and free cancer cells are frequently found in the alveoli. Extension along surfaces is a marked characteristic of the tumor, which is repeated, as will be seen later, in the pial growth. The tumor is spreading along the lymphatics, which are much dilated. Invasion of the walls of blood vessels is not observed. The terminal bronchopneumonia has occurred in areas which were already infiltrated by the carcinoma, and sections here show an interesting mixture of the two conditions.

Sections from various cortical areas, the cerebellum, medulla, and the cord in its entire length show a remarkable infiltration of the pia-arachnoid with tumor (Fig. 1). The carcinoma has in general displaced the endothelium and lines the arachnoid septa with usually a single layer of tumor cells. This infiltration is very diffuse and widespread, the tumor creeping over the surface and following the extensions of the pia into the sulci. Where the growth is more advanced, the epithelium of the tumor is reduplicated and has proliferated within the spaces. There is a tendency to the formation of papillae and the spaces are filled with desquamated tumor cells. This appearance is entirely similar to the tumor in the lung and to other

metastases. The growth is more extensive in the sulci than on the crests of the convolutions. Sections from all parts of the brain surfaces show some foci of carcinoma, but the infiltration is not uniform, as the pia is normal over considerable areas. The tumor nowhere breaks through the subarachnoid space externally, and the dura is everywhere normal.

Where the tumor is present the arachnoid cells have disappeared. Occasionally they may apparently still be seen underneath the covering of cancer cells. At points where the tumor cells are advancing, the arachnoid cells are in immediate proximity to them. This displacement of the arachnoid cells shows that the tumor has the same

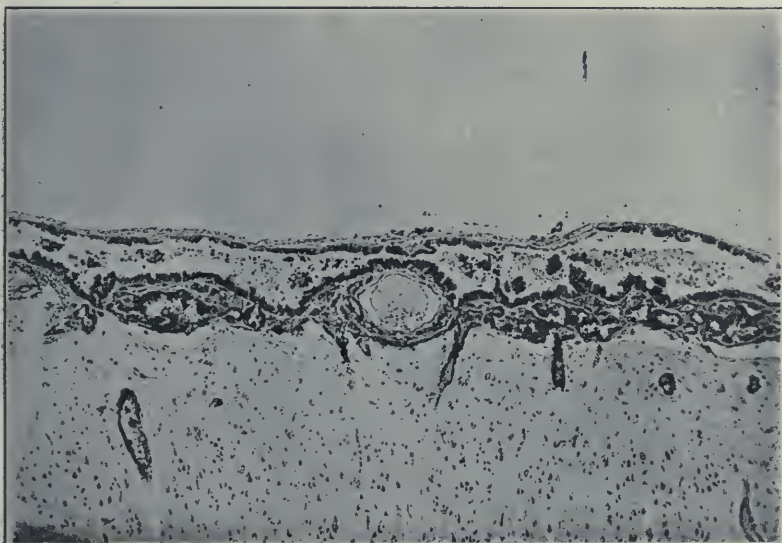


FIG. 1 (Case 1). Showing involvement of the pia arachnoid by the carcinoma and extension into the cortex along the perivascular spaces.

peculiarity of growth in the subarachnoid space as in the lung, where it extends along the alveolar walls in a single layer, replacing the epithelium.

There is a mild infiltration of the pia in uninvaded areas with lymphocytes and fat-containing phagocytes. The pial vessels are greatly dilated. The subarachnoid sheath of the optic nerves is markedly invaded by the tumor, both at the chiasm and peripherally to it. There is some accompanying lymphocytic infiltration. The origins of the fifth and sixth nerves are surrounded by masses of growth. The same is true of the seventh and eighth, and here the tumor is present also among the nerve bundles. (Fig. 2.)

There is a large focus of growth in the choroid plexus of the lateral ventricle. The choroidal epithelium is displaced in a manner similar to that of the pia and the alveoli of the lung. The tumor



FIG. 2 (Case 1). Point of exit of the eighth nerve. The tumor extends along the nerve and is also present in the pia.

extends into the nerve tissue at one point but not along the ependyma. Other parts of the lateral ventricles show no tumor. Sections from the fourth ventricle show a few deposits of tumor cells but no invasion of the underlying tissue.

In the cord the infiltration of the pia-arachnoid is heavier and more widespread in the cervical than in the dorsal and lumbar

regions. The tumor is growing along the pial covering of both anterior and posterior roots, and in one section is seen extending into the anterior fissure. The carcinoma cells form a complete sheath around some of the nerve bundles. The nerves of the cauda are extensively invaded both on the exterior and among the nerve bundles. One nerve contains a nodule of growth 2 mm. in diameter. (Fig. 3.) Section of a spinal ganglion shows marked involvement of the roots.

In almost every section of the cortex and in the cerebellum the tumor extends into the cortex as a lining of carcinoma cells in the perivascular spaces. (Figs. 1 and 4.) Sometimes this invasion is by a single layer of cells, at others by a layer on the outer and inner walls of the perivascular spaces, separated by an intervening space.



FIG. 3 (Case 1). Invasion of a nerve of the cauda equina by carcinoma.

At points on the vessel wall where the tumor has just penetrated there is lymphocytic infiltration and deposition of green pigment. This tendency to extend into the cortex along the perivascular spaces is a prominent feature and in places the invasion is to a considerable depth.

Several sections show quite large intracortical growths with accompanying softening of the cortex. These foci are usually not far from the meninges and could have originated from the perivascular extensions of the tumor. The cancer here is of a papillary type, similar to the metastases in the trunk organs, and is proliferating luxuriantly. The brain tissue remaining in these foci is necrotic and is packed with compound granule cells. The vessels in these areas show a hyaline degeneration of their walls and an obliterative

endarteritis. There is occasionally a diffuse infiltration of the vessel walls with cancer cells and the latter may be seen bridging the lumen. Complete thrombosis by cancer cells is also present. Small vessels at some distance from the periphery of these intracortical foci show infiltration of their perivascular sheaths, and the tumor is evidently pushing out in this way.

The nerve cells in the tissue immediately surrounding tumor foci are in various stages of degeneraton. There is no inflammatory or glial reaction and no evidence of compression of the brain substance. There is lysis of the nerve tissue where the tumor comes in contact with it and it simply melts away.

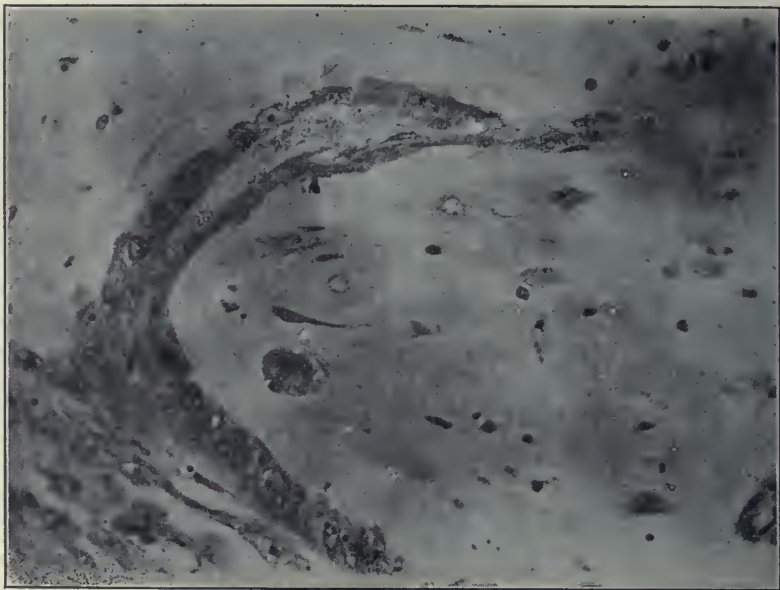


FIG. 4 (Case 1). Extension of the tumor along the perivascular space surrounding a cortical capillary. Higher magnification of the section shown in Fig. 1.

Changes in the uninvaded cortex are slight. Lamination is normal and the nerve cells stain well except for occasional shrunken ones which may well be due to formalin fixation. There is no undue satellitosis and no vascular thickening. Some sections show a few lymphocytes and considerable collections of lipoid pigment around the vessels in the white matter. Scharlach R brings out moderate deposits of fat along the course of the vessels and in the nerve cells. There is a general thickening of the subpial glia and numerous spider cells beneath the surface. Sections of the medulla show slight extension inward of the pial tumor at the points of origin of the cranial nerves, where, as has been said, the growth is abundant. The cord is not invaded.

Case II. C. S., aged forty-two. Widow. Domestic. Her past history is unimportant. Her health had always been excellent, and she was of an amiable, even disposition with no peculiarities of mental make-up.

Present Illness: She had noticed a lump in the left breast for three months and had had gradually increasing pain in it. Her weight had fallen from 174 pounds in the summer of 1921 to 143 pounds in February, 1922. Four weeks before admission to the Boston Psychopathic Hospital the patient had two convulsions in rapid succession without premonitory symptoms. She is said to have "stiffened out," but no further details are known. From that time she was weak, in bed, and presented some mental disturbance, as she was described as "acting queerly."

Two weeks later she was admitted to the Peter Bent Brigham Hospital, where it was stated in the examination that "she was not entirely rational, although able to collect her thoughts to a moderate degree with great effort. Her memory is markedly impaired and she does not coöperate in the examination." She was well nourished. No glandular enlargement in the cervical or inguinal regions. The chest and abdomen were negative. She walked with a drunken stagger and was unable to maintain her balance even with eyes open. The temperature was subnormal on admission and later varied between 100 and 101; pulse 90-96. X-ray plates of the chest and spine negative; those of the skull unsatisfactory.

The second night at the hospital she became confused and agitated. The breast tumor was considered inoperable. The possibility of intracranial metastases was considered, and the patient was transferred to the Boston Psychopathic Hospital.

On admission there she was restless and confused, but reasonably coöperative. An hour after admission she was found sitting on the floor of her room, and when put into bed she was discovered to have a fracture of the upper third of the right femur. This gave her little discomfort, either then or later, except on direct manipulation.

The mental picture during her stay at the Boston Psychopathic Hospital was one of partial delirium, with varying contact with the environment, hallucinations, complete disorientation, and very little memory. She could be aroused during interviews, appeared to understand questions, at times answering pertinently, at others giving inconsequential, muttering replies. She reacted at times to auditory hallucinations. For the most part, however, she was dull and drowsy with considerable mumbling, unintelligible talk.

Examination of the discs showed haziness of the margins, but no fullness of the veins nor tortuosity of the arteries; apparently a toxic condition rather than increased intracranial pressure.

Patient grew steadily more stuporous, developed bronchopneumonia, and died eleven days after admission to the Boston Psychopathic Hospital.

Autopsy showed metastases in the brain, pituitary, pancreas,

intestine, adrenals, mesenteric and retroperitoneal fat, ovaries, and femur.

Attached to the dura in the posterior fossa on the right side near the midline was a carcinomatous nodule measuring $1.5 \times 1 \times .5$ cm. The pia was slightly injected but otherwise not remarkable. The basal vessels were somewhat thickened. Brain weight 1090 gms. The superior surface showed atrophy in the frontal regions. The cerebellum contained three metastases, each about 1 cm. in diameter, one on the upper surface anteriorly; another at the free edge of the cerebellum posteriorly, and the third in the right lobe near the tonsil.

On making frontal sections of the cerebrum at intervals of 1 cm. three other metastases were disclosed. The first, about 8 mm. in diameter, lay in the anterior part of the right second frontal convolution; the second, 1 cm. in diameter, in the right parietal region bordering on the great longitudinal fissure. These lie partly in the cortex and partly in the white matter. The third nodule was in the posterior part of the right internal capsule opposite the pulvinar.

A short summary of the microscopic findings is as follows: There is no invasion of the pia in any of the sections except immediately over foci which lie on the surface, and not always even then.

The cerebral metastases are formed of a very cellular growth which invades the tissue in strands and thick solid columns and masses. The metastases to the brain are more cellular than those in any other organ except the lymph nodes and the pituitary. The nerve cells in the immediate vicinity of the foci show considerable satellitosis, and there are clumps of glia nuclei similar to those seen frequently in epidemic encephalitis, and probably representing the former site of a nerve cell. Proliferation of the vascular endothelium is general in the neighborhood of the tumor and some of the small vessels at the edges of the growth show a diffuse infiltration of their walls with carcinoma. Abundant young glia cells with large protoplasmic bodies are present at the edges of the nodules and also among the tumor cells, where they have been engulfed by the advancing growth. Around some metastases there is considerable formation of fibrillar glia. There is no inflammatory reaction.

The cortex in various areas shows a good representation of nerve cells. A number of the large pyramids are shrunken and many of the nerve cells stain rather lightly and diffusely. The cortical cells contain considerable lipochrome. There is a moderate amount of fat around the cortical vessels and much lipid pigment in the perivascular spaces in the white matter. Small extravasations of blood are present at a few points. There is no special satellitosis. The cortical arterioles are somewhat thickened.

Hassin (1) has recently described the changes which he found in the brain tissue in cerebral carcinoma as a toxic encephalitis. These changes included advanced degeneration of the nerve cells, even at a distance from the metastases, invasion of ganglion cells by cancer cells, glial proliferation, and new formation of capillaries. In our case the lesions in areas remote from tumor foci were, as described

above, of a minor nature and could not be characterized as, encephalitis.

Sections of the medulla and cord show a thickening of the superficial glia and a few perivascular collections of lymphocytes. In the dorsal cord there is a fresh thrombus in a large vein in the posterior horn. The nerve cells in the medulla stain rather diffusely and lightly, like those in the cortex. The cells in the cord stain well.

The ependyma and choroid plexuses of the lateral and fourth ventricles are normal. A section showing the dura and the arachnoid villi projecting into the superior longitudinal sinus is normal. Sections from the second, third, and seventh nerves and from the cauda are also normal.

Discussion: Invasion of the nervous system by carcinoma is comparatively rare considering the frequency of cancer in general. The brain seems to offer more resistance than most other organs to the settling of carcinoma cells. Cerebral metastases occur most often in carcinoma of the lung and the breast. The frequency with which cancer of the lung gives rise to foci in the brain is striking; in fact, the brain and the adrenal are the favorite sites for metastases. Dosquet(2), in reviewing a collection of 105 autopsied cases of carcinoma of the lung, found that there were metastases in the nervous system in 31.4 per cent. Kaufmann's (3) statistics show that those carcinomata which give metastases in the lung with relative frequency are more likely to invade the nervous system. This is in keeping with the great frequency of cerebral metastases in primary cancer of the lung, as invasion is usually through the blood stream in both instances.

Of the possible routes by which tumor cells can reach the central nervous system, the first is through the blood stream. If there are metastases in the lungs, tumor cells may easily gain access to the pulmonary veins and thus be carried to the left heart and then as emboli to the greater circulation. There may also be a fixation of tumor cells in the lung which gives rise, not to foci in the lung tissue, but to a carcinomatous endophlebitis by which the cancer cells may reach the left heart. Even without the formation of metastases tumor cells may slip through the comparatively wide capillaries of the lung into the greater circulation.

The second path of invasion is along the perineural spaces, which are continuous with the subarachnoid space. In order to have invasion by this route the nerves must end in an infiltrated region.

Under this heading would come invasion by way of the cervical glands and cranial nerves. There is an indirect connection between the cranial nerves and the cervical glands which serves as an acces-

sory channel of drainage for the cerebrospinal fluid. Weed,(4) using potassium ferrocyanide solutions and precipitating granules of Prussian blue by means of iron ammonium citrate, has injected the cervical lymph nodes from the subarachnoid space. The pathway is along the perineural spaces, then through tissue spaces into the lymphatic radicles, as there is no immediate connection between the perineural spaces and the lymphatics. In the cord there is a similar relation between the perineural spaces of the anterior and posterior nerve roots and the lymphatics. To explain invasion of the central nervous system by this route it must be assumed that the tumor cells have escaped into the tissue spaces around the lymphatics and that they travel against the current.

It seems reasonable that invasion of the central nervous system by these two pathways, the vascular and the perineural, would give rise to two different pathological pictures. The tumor cells brought by the blood stream would cause nodules within the brain substance without involvement of the meninges. This is by far the commoner form of cerebral metastasis, and the growths are situated most often at the junction of cortex and white matter.

If the tumor cells arrived by way of the perineural spaces, however, they would enter first the subarachnoid space and only secondarily the cortex. Apparently this mode of invasion is comparatively rare, for only a limited number of cases of so-called carcinomatous meningitis have been reported.

The chief features in the contrasting pictures of the two cases here described could be explained by the two modes of invasion, although neither case seems to be a pure type. In the first case there was a diffuse involvement of the subarachnoid space, both cerebral and spinal, also of the cerebral and spinal nerve roots. The growth extended for short distances into the cortex along the perivascular spaces, which are prolongations of the subarachnoid space. The fact that the primary tumor in the lung is a surface-growing and not a vessel-invading growth may have a bearing on the route by which it reached the nervous system, *i.e.*, it entered by extending along a surface, that of the nerves. The small cortical metastases seen with the microscope and the larger ones which border on the exterior doubtless have arisen from the perivascular extensions, but one might have to assume a vascular origin for the massive growth in the occipital region which has no obvious connection with the exterior, and also for the metastasis in the choroid plexus, unless the tumor cells in the latter case traveled back through the aqueduct.

The most probable path of invasion in this case would seem to be from the parietal pleura, which contained tumor nodules, along the intercostal nerves. Another possible route would be along the vagus, and still another through the cervical glands, although they were not enlarged clinically. Unfortunately, when the case came to be studied no material was at hand to test the validity of these hypotheses.

The second case is in contrast to the first. The pia was not involved except in continuity over the metastases which bordered on the surface. The tumor formed large nodules, some of which were situated deeply. The cranial and spinal nerve roots were normal, as was also the dura except for the carcinomatous mass attached to it in the posterior fossa.

The condition of carcinomatous meningitis, *i.e.*, a diffuse infiltration of the pia and nerve roots without, or with only secondary involvement of the brain substance, has been differentiated and clearly described only in comparatively recent times. Sanger (5) gave the first description of the condition. In a case of carcinoma of the breast he mentioned finding thick collections of cancer cells in the pia of the convexity and base and at the points of exit of the cranial nerves. The first accurate pathological report was given by Lilienfeld and Benda (6) in 1901. Eberth, (7) however, in 1870 reported a case of what was probably carcinosis of the pia following cancer of the lung. He considered it a primary endothelioma of the pia; but the pathological description is not clear, and in the light of later studies and of the presence of a carcinoma in the lung the diagnosis of carcinoma of the meninges is more probable.

Heinemann (8) in 1911 was able to collect 19 cases from the literature, and Humbert and Alexieff (9) in 1913 found 23 cases, to which they add one of their own. From that time there seems to be nothing more on the subject in the literature until Hassin (10) in 1919 investigated the pathology of the condition on the basis of a case of his own. Meyer (11) has recently reported two cases. Bertrand and Aronson (12) have also recently described a case of cancerous leptomeningitis which they consider primary in the meninges.

The largest number of reported cases have followed cancer of the stomach, the two other tumors most frequently represented being cancer of the lung and the breast. In Heinemann's series of 19 cases, 9 were carcinoma of the stomach and the others carcinomas of the lung and breast, with the exception of one of the cecum.

In several instances the conditions were similar to those in our

first case, *i.e.*, the primary tumors, both of the lung and of the stomach, remained latent, and the disease ran its course entirely under the guise of a cerebral affection. In a number of cases also the invasion of the meninges was discovered only on microscopic examination. Other cases at autopsy resembled a tuberculous meningitis. In Bertrand and Aronson's case the clouding of the pia was so marked as to suggest paresis.

An unusually pronounced enlargement of the cervical glands is mentioned in several protocols. If, however, invasion of the nervous system by way of the lymph nodes of the neck is frequent, it seems strange that no case of carcinomatous meningitis has been reported following cancers of the tongue or face, in which involvement of the cervical glands and diffuse extension into the tissues of the neck is an inevitable occurrence.

The symptoms most often reported have been headache, vomiting, pain and stiffness in the neck, and psychic disturbances of various kinds, followed by a lapse into stupor. In some instances these symptoms developed rapidly at the onset of the illness; in others they closed the scene after a variety of earlier manifestations. Where no primary tumor has been apparent, the diagnosis has most frequently been tuberculous meningitis. In Lissauer's (13) case, which followed carcinoma of the colon, the diagnosis of brain tumor was made on the evidence of epileptiform convulsions, vomiting, vertigo, headache, paralysis of the extremities, and choked disc. McCarthy (14) remarks of his case, without further elaboration, that the clinical course was that of cerebrospinal syphilis.

In other cases psychic disturbances have been the outstanding feature. The onset with vague mental symptoms, accompanied by neurological signs, and followed by mental reduction gave rise in Heyde and Curschmann's (15) case to the diagnosis of paresis. Their patient, who had a latent carcinoma of the lung, presented headache, dizziness, vomiting, uncertainty of gait, and transient diplopia. Psychic deterioration finally became prominent. There was paralysis of the third and seventh nerves and weakness of the twelfth. Finally meningitic symptoms, delirium, and coma developed. The duration of this case was unusually long, being seven and one-half months.

Löhe's (16) patient, a case of latent carcinoma of the lung, was also thought to have a psychosis because of the development of mental symptoms—dullness, apathy, sleepiness, confusion, and disorientation. There was also falling to the left and edema of the disc.

Peabody's (17) case, although typical pathologically, differs from the others in the absence of mental symptoms. The patient, who had had a cancer of the breast removed four years previously, developed severe general pains, polyuria (low specific gravity, casts, no sugar); continuous fever, and fluctuations of the pulse (100-160) without cause. At the end there were various facial paretic symptoms.

Examination of the cerebrospinal fluid has sometimes, but not always, given a clue to the diagnosis. In Schwarz and Bartel's (18) case the finding of great numbers of large atypical cells changed the previous diagnosis of tuberculous meningitis to neoplasm. In Peabody's case, however, the fluid showed only a few lymphocytes. In Bertrand and Aronson's and in Meyer's second case there was an increase in albumin and some large swollen cells of uncertain nature.

The question has been discussed as to whether there is a difference in symptomatology between the intracerebral and the meningitic types of metastatic carcinoma. Siefert (19) outlines the following picture which he believes leads to the probable diagnosis of multiple carcinomatous metastases in the central nervous system, even when the primary tumor is not found or not diagnosed with certainty: Advanced age; extraordinarily rapid failure of health; increasing apathy and difficulty of thought; often a peculiar alternation of delirium and comparative clearness; a peculiar disturbance of speech recalling paresis. Absence of optic neuritis, pain in neck and root symptoms, such as pains and bladder disturbances. Presence of weakness of the seventh nerve and extremities, especially on the right; changes in the gait and knee jerks. This characteristic picture, he says, occurs in no other condition.

Pachantoni (20) considers that the symptoms in the multiple nodular form are more psychotic in character, while in carcinoma of the pia the early stages are either latent or so indefinite that they are taken for "hysteria." There then follows an outburst of cerebral symptoms—convulsions, paralyses, and stupor—which, as in his own case, may be so sudden and violent as to raise the question of apoplexy, or when more protracted may resemble meningitis.

In regard to the mental symptoms of multiple carcinomatous metastases to the brain, Barrett (21) reports a case which presented an unusual degree of psychic symptoms. The primary tumor was an epithelioma of the forearm. The last illness began with deterioration of health, unusual worry over household tasks, loss of intellectual power, headache, vomiting, and impairment of vision, and later motor and sensory paralysis of the right side. On admission

to the hospital her talk was rambling and showed fabulation, paraphasia, and perseveration. There was apraxia, also choked disc and bilateral paralysis of the sixth nerve.

Binswanger (22) has recently given a detailed discussion of the mental symptoms in a case of multiple metastases to the brain following carcinoma of the breast. The patient was psychopathic and the first symptom of the brain metastases was an intensification of her original characteristics, particularly of her depression and anxiety. This increase of psychopathic traits at the onset of an organic nervous disease is not infrequently observed, and usually serves to delay or to obscure entirely the recognition of the true condition.

The distinctions given above in the symptomatology of the two types of metastases to the nervous system seem to hold good in a general way when a number of cases are collected, but, judging from the study of the series of cases of carcinomatous meningitis, there are so many exceptions and the clinical picture is so complicated and far from clear cut that the value of the differential points in any particular case would be limited. There is no special gain in such refinement of diagnosis for both types are equally inaccessible to treatment.

It is important to recognize that a change in personality without symptoms of increased intracranial tension may be the earliest indication of a brain tumor, either primary or metastatic. The picture may be quite vague and indecisive at the beginning. In those cases which are not accounted for by syphilis, arteriosclerosis, or other apparent causes, the possibility of tumor should be borne in mind; also the further possibility that the primary growth may be latent elsewhere and the brain tumor secondary.

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A NOTE ON DR. CHARLES LEPOIS' WRITINGS ON HYSTERIA

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Charles Lepois—Carolus Piso—(1563–1633) was consulting physician to Duke Charles III of Lorraine, in 1593, and in 1617 became physician to King Henry II of France. Some time afterward Henry II founded a Faculty of Medicine at Pont-à-Mousson and Lepois was made dean and first professor. He was a physician who, possessing great erudition, had at the same time a very observing mind. One of the most important of his works—he wrote several—is: “*Salectiorum observationum et consoliolorum de praeter visis hactenus morbis affectibusque praeter naturam ab aquâ, seu serosa colluvië et diluvië ortis, hiber singularis, etc. Ponte ad monticulum, Op. Carol. Mercatorem MDCXVIII.*” This work went through several editions and Boerhaave edited one, with a preface, in 1733.

The chapter in which Lepois deals with hysteria is entitled: *Morbi capitis a colluvië serosa*.

In the part entitled *Consilium de epilepsia quo symptomata hysteria quidem vulgo dicta ad epilepsiam referuntur*, Lepois unhesitatingly shows the mistaken theories of the ancient writers, his statements being based on experience. In principle, he expounds this opinion: “*Hysterica symptomata vulgo dicta, omnia pere viris cum mulieribus communia sunt.*” (The symptoms ordinarily called hysterical, are almost all common to both men and women.)

This opinion clearly eliminates the uterus as the site of hysteria and according to the author the nerves play the most important part in this psychosis. “*Quoniam igitur, in hysterica suffocatione, totum convellitur et regescit corpus, principium sane nervorum patiat necesse est.*” (Since in hysterical suffocation the entire body is seized with convulsions and stiffens, it is necessary that the principle of the nerves is diseased.)

Unlike Galen, Lepois does not admit that hysteria results from retention of the menstrual blood. He refers to a *nobilissima virgo*

who had a most stubborn hysteria and whose menstruation was perfect. Further, he points out that the psychosis occurs in little girls, in women past the menopause or those having profuse menses and finally that hysteria occurs in males.

Our author also differs from Hippocrates. It is neither the uterus nor the stomach, or any other viscus which causes hysteria—it is the head: “*taque concludamus, tot tantarumque symptomatum quae falso hysterica creduntur, parum justis de causis uterum, ventriculum, aut aliud et visceribus accusari, sed eorum omnium unum caput esse parentem, idque non per sympathiam, sed per idiopathiam, effectum male et perculsum eos motus universum corpus concutientes* (Boerhaave's edition).

Hysteria hardly differs from epilepsy. The starting point of the attack is in the central nervous system, and he says if the entire body stiffens, distends and is convulsed, it is not because the head becomes involved in the process, but because the principle of the nerves is involved and the cerebral meninges, of which the nerves are but an extension, are themselves shaken and rendered rigid.

Lepois attempts to explain physiologically the accidents of hysteria and he reaches this remarkably exact conclusion, although theoretically it is absolutely false: “*Certe sensirium commune sive principium sensuum omnium in his affectibus laedi necesse est.*” (It is necessary that it be the *sensorium commune*—principal of all the senses injured in these affections.) He then adds that it has been demonstrated (*sic*) that the organ of the *sensorium commune* is the animal spirit which is seated in the ventricles of the brain. The brain contracts and expels the fluid—*colluvies serosa*—into the hollow of the nerves, hence first provoking restlessness, afterwards rigidity.

“*I am animi perturbationes sive terror, sive laetitia ex inopinato suborta evidente sane ex causa hystericos cient affectus; videlicet per haec animi prathemata membranae cerebri nunc contrahuntur compri-munturque, nunc explicantur et dilatantur; his autem sive contractis, sive explicatis aquam residem necesse est commoveri et in cava nervorum aut sponte exundare, aut veluti exprimi.*” (Disturbances of the soul, fear, joy, and any sudden perception, provoke the development of hysteria, because the emotions of the soul submit the membranes of the brain to alternatives of contraction and compression on the one hand, on the other to extension and dilatation; now, in the movements of contraction or extension, it is essential that the water

contained in the membranes be placed in a state of agitation, and consequently passes into the cavity of the nerves or else is expressed.)

"Summam ergo tandem indemus, concludamusque varia illa salvaue symptomata hysterica vulgo dicta, quibus nobilissima virgo hactenus vixit obnoxia, non a retentis in utero mensibus, corruptive circa uterum semine, sive seminiformi substantia, non a viscerum, sive splenis, sive ventriculi impuritate originem trahisse, sed unam somitem habuisse, plenitudinem scilicet serosam in postico capite stagnante servantem; et principia nervorum omnium implentem ac copia distendentem, et contrahentem in se, unaque membra omina non solum externa, sed interna quoque convellentem, imo etiam sensum labefactantem; colluviem autem aquae in capite stagnantis scaturire primo et derivari e visceribus et praesertim liene, totoque corporis habitu seu rivulum quemdam e pontibus varlis et simul confluentibus, sed in caput affluxam per varios sinus toto cerebro insculptos, et postico capite terminatos huc committere, non tam forte ob meatus externos minus liberos et parentes, quam ob declinitatem loci; collectam denique postico in capite ratione caloris loci et inculcationis fervorem quemdam concipere, ratione cujus duo nervorum principia subiens, ibique subsistens ob ingenium, superum potius locum quam affectans, et subinde affluens usque et usque sua tandem mole distendit corrugatque appendices nervosas et musculosum genus, inso vero membra omnia sive interna, sive externa."

Let us sum up these facts and conclusions. The cruel symptoms, vulgarly called hysterical, that this noble young lady underwent, are not due either to retention of the menses in the uterus or to corrupted uterine fluid—whether it be the female seminal fluid or any other similar liquid—nor to affections of the viscera, for example, the liver or stomach, but clearly to a fluid collection accumulated in the posterior part of the head and there becoming amassed, swells and distends the origin of all the nerves, to set up (extend) convulsions in all parts, not merely external, but internal; then seizing upon the consciousness, this fluid mass changes the parts where it remains (is retained); it comes from the viscera, principally from the spleen, as well as from all other parts of the body. Thus as a river results from the concurrence of a number of small streams which unite to form it, likewise in the sinuses which are upon the surface of the brain and end at the posterior part of the head the fluid becomes amassed, not merely because there are empty spaces through which it can accumulate there, but on account of the declivous position of the head. The

heat of the parts warms this fluid, it reaches the origin of the nerves and ends by distending them, rather more in the upper than in the lower part; then progressively extending, it distends and destroys the nerve ramuscles, then the muscles and finally carries its ravages into all the organs, both external and internal.

At another page (103 of the *Editio princeps*) Lepois says that he does not know whether this affection inspires more terror or astonishment, even in physicians versed in practice, because it paralyzes both sentiment and movement. Sight and hearing are abolished and nothing arouses the patient from his torpor.

From the clinical viewpoint our author also refers to cutaneous anesthesia, deafness, cecité and aphonia. He relates the case history of a noble abbess who, for one or two days preceding the hysterical attack, her lost hearing, was seized by aphonia, then cecité, and finally became practically inanimate. A little further on in the text the case history of a young girl is given, who was about to be buried and would have been had she not awakened in time. He also writes: "*Et in famosa illa virgine galla Maturina, quae promortua medicis, etiam habita, hujus lapidis primo olfacta e lecto restituta, alacris extemplo praeter spem ad mensam aleamque cucurrit.*" (As to Mathurine, the famous young French girl, who was supposed by all the physicians to be dead, as soon as she inhaled the odor of this stone, arose from her bed, quite well and happy, and against all hope started to eat and play.)

During the sixteenth and seventeenth centuries numerous were the instances of hysterical sleep, as are related in the many epidemics of demonopathy occurring during these eventful epochs, but until the advent of Charles Lepois, no physician had ever traced them to their true cause.

Lepois also speaks of paralysis of the upper and lower limbs and he is also the first writer to refer to hysterical tremor preceding paralysis.

"*Sed et annotari, hoc anno, in altera ingenua vicina nostra de qua ante, quae, a secundo paroxysmo, tremorem brachiorum insignem passa est, tertio tandem in palalysim eorundem incidit.*" (I noticed this year in a young women, a neighbor of mine, that after a second paroxysm she presented a remarkable tremor in the arms which ended in a paralysis with the (development of) third paroxysm.

Our author also noted the occurrence of salivation, both in the male and female, at the end of the paroxysm. He also states that he

has seen hysteria in men and children. He compares hysteria with epilepsy, from which one may suppose that he had met with cases of hystero-epilepsy.

At a later epoch Thomas Willis maintained and developed the ideas emitted by Lepois, which resulted in the famous polemic between him and Highmore.

To conclude this short contribution to the history of the "great neurosis," it may be justly said that Charles Lepois was the first writer to reject the erroneous opinion which had reigned for centuries, namely, that the seat of hysteria was in the uterus. The work of Willis is undoubtedly remarkable in that while upholding Lepois' opinion, he still further cleared it up by hypotheses and discussions with all the rigor that is to be expected from an anatomist and a savant of the first rank.

Finally, Sydenham made an epoch in the history of hysteria by his wonderful clinical descriptions and observation.

CASE OF ESOPHAGEAL DIVERTICULA SIMULATING A PSYCHOSIS *

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The presentation of a symptomatology apparently characterized by psychotic elements, but really due to some physical condition, of a construction entirely irrelevant to a psychosis is of frequent occurrence. That such a condition should go unrecognized and be attributed to some disease of the central nervous system is becoming more infrequent. Every day highly specialized scientific medical research is demonstrating that the chronic psychoses are far less idiopathies and psychogenicities than was heretofore adjudged. This change is the natural result of tremendous advances made during the last two decades, in our research methods. The rationality of the minute investigation of cause is undeniable. All nature tends towards perfection; this is possible because of the axiomatic acceptance of the fact that a definite cause produces a definite effect, and thus nature is never at a loss as to how to proceed towards reestablishment of a normal equilibrium. Were this not true, the human race would have perished countless centuries ago. An illustration is the well known fact that syphilis¹ amongst the Medes and Persians was, and still is, considered no more than a severe exanthem, also, witness the application of Profeta's Law.² These are triumphs of Nature. When the cause cannot be eradicated, Nature elaborates a protective barrier. All our advances in modern medicine follow this example. Where disease causation cannot be eliminated we erect as intact a barrier of prophylaxis as possible, also, the keenest scientific minds are at no variance in feeling that should we fail of determining the cause underlying a mental, or any other disorder, either the complete diagnostic armamentarium has not been exhausted, or else science has not yet provided the *modus operandi*. Every mental case should be carefully worked through the gamut of laboratory procedure, in the hands of a personnel whose work should be the expression of the

* I am indebted to Dr. Wm. MacLake, Medical Director and Superintendent, for permission to publish this case.

¹ *Jour. A. M. A.*, April 22, 1922, p. 1197.

² Osler. *Practice of Medicine*. 1913.

utmost sincerity and diligence. The equipment of a department for the thorough investigation of nervous disorders should be complete in every detail. In order to fully justify his comprehension of each individual case, the psychiatrist must have every advantage of serology, pathology, bacteriology, X-ray, bio-chemistry, dentistry, electro-cardiology, endocrinology and lesser laboratory aids. The recognition of this need is being reflected by far less of a hesitancy in meeting heavy expenditures, incident to the inauguration and upkeep of these all important accessory departments than formerly.



FIG. 1

Yet, even in the light of our modern understanding, cases present themselves, which have gone for many years, wrongly diagnosed and even thereby stigmatized, whilst the real cause has existed unidentified.

The case which follows, apart from the interest of its psychotic atmosphere, presents a rarity,³ the very nature of which may serve to mitigate the apparent lack of diagnostic accuracy.

H. Mc., white male, aged twenty-six, was admitted to the National Military Home, Indiana, on August 26, 1922. The history of his childhood and youth shows that he was never considered particularly robust. He always stammered somewhat and had a husky voice. In the early twenties his teeth were in such bad condition that

³ Post Graduate. New York, XXIX, 925-936.

the whole denture was extracted. The septic intoxication accompanying this condition undoubtedly produced a thyrotoxicosis, leaving in its wake a slightly enlarged right lobe and a pulse of 94. In May, 1918, whilst in the army, he suffered from a severe attack of bronchitis, which confined him to bed for two weeks. During convalescence he began to notice a certain choking sensation, associated with the mastication and swallowing of food. Over a period of two or three years, this condition gradually became worse. Diagnoses of "scarlet-fever throat," "diphtheroid condition," "tuberculosis," were made. Finally the aggravation became characterized by irregular attacks of vomiting without nausea. This provoked numerous stomach contents analyses, which were of little avail. Not finding relief, the man began to give up hope, lost weight, and became depressed. His condition was classified as "hysteria," associated with "psychic vomiting." From this it was no far cry to the assumption that the man was a victim of some psychotic condition, undiagnosed. A neuropsychiatric hospital was indicated and the man was sent here.

A careful analysis of this man's complaint identified the following: The attacks of vomiting were irregular and when they occurred, it was immediately after the ingestion of food. The usual prodromal feelings of nausea did not attend the attacks. Savory, spiced foods seemed more liable to produce the vomiting than the more bland cooked cereals. Always after eating he experienced a choking sensation in the laryngeal region. His bowels were irregular, being sometimes constipated, at other times quite watery. At night he sometimes dreamed that a man was cutting his throat.

Physical examination shows average height and weight; pulse 94; respiration 22; systolic and diastolic blood pressure of 118 and 76, respectively; no teeth. Urinalysis, blood counts, blood Wassermann, feces analysis and three-hour fractional gastric-analysis are entirely uneventful. X-ray examinations of the head, chest, sinuses and gastro-intestinal tract from the cardiac orifice to the anus are without abnormal incident. The basal metabolic rate is estimated at plus 15 per cent. Roentgenological examination of the esophagus clearly demonstrates the presence of esophageal diverticula. Instead of the barium meal being carried backward⁴ and downward, physiologically, part of it makes the descent of the pharynx in a forward direction, where it is retained in two small pouches, one each side of the central prominence of the thyroid cartilage. Two and one-half centimeters below, at the level of the cricoid cartilage, are two larger bilaterally symmetrical pouches. The smaller pouches each have a capacity of about two cubic centimeters, the larger ones five cubic centimeters. The pouches slowly emptied over a period of about two and one-half hours. The reproductions show profile and several antero-posterior views of the condition taken at various times during the examination. The patient was able to expedite clearance of the pouches by lying

⁴ Howell. Physiology. 1921.

in a modified Trendelenberg position, face down, deglutition taking place uphill, as it were.

Recent literature on the subject does not remark such a peculiarly interesting anomaly, exhibiting two bilaterally symmetrical sets of pouches occurring anteriorly in the pharyngo-laryngeal region. Diverticula of a traction or pressure etiology are fairly common, but they are usually unilateral and posterior with the cause less obscure.

The whole condition is undoubtedly congenital, expressed at first merely as a huskiness in the voice. As before mentioned, esophageal pressure⁵ or traction as a cause is rather remote on account of the location⁶ and symmetry of the pouching, as well as the history. An

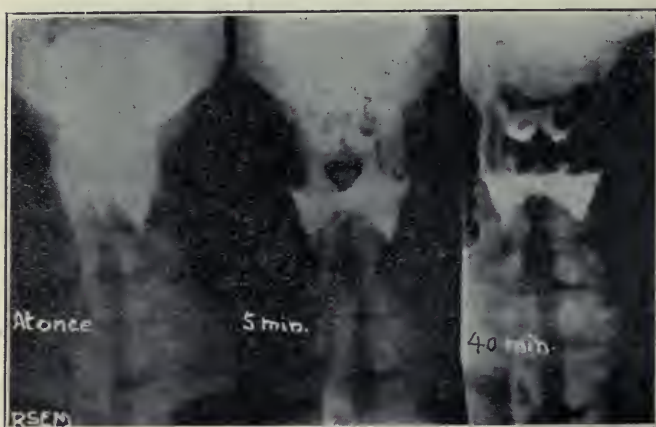


FIG. 2

analogous situation is presented in regard to inguinal hernæ—congenital but masked until some emergency discloses the anomaly. So, in the above case, the acute attack of bronchitis with its attendant coughing, served to fully expand the anomalous foldings of the pharyngeal mucous membrane and submucosa, this producing the diverticula. An interesting feature is that, whilst the pouches could retain nonirritating foods with little or no discomfort, the introduction of highly seasoned foods produced the typical vomiting reflex. Unidentified, after four years, the man's condition actually began to assume the proportions of a psychosis, until a thorough research reduced conjecture to actuality.

⁵ Hewlett. *Monog. Medicine*, Vol. I, 1916.

⁶ Mayo, C. H. *Diagnosis and Surgical Treatment of Oesophageal Diverticula*. *Ann. Surg.*, 1910, LI, 812-817. 2 pl.

AN EPIDEMIC OF ENCEPHALITIS GRIPPOSA

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The writer reports a series of cases in Kiew occurring in the early months of 1920 which he considers as representing an epidemic. He believes that the involvement of the nervous system together with many other features in common among the patients as well as the number of cases and the infectious character of the disease justified his opinion. Owing to interference with postal and railway service he was unable to compare this local appearance with possible similar epidemics elsewhere. Furthermore, his observations were somewhat limited because an epidemic of typhoid and the closing of the university clinics prevented the hospital treatment of his patients, while among the few fatal cases necropsy was impossible. He reports in detail the most interesting cases:

Case I. S. U. Male. Forty-four. Patient consulted the physician December 17, 1919. Complained of feeling unwell and dizzy. He gave the impression of one very ill, answered questions slowly and hesitatingly, in a monotonous voice continued to complain of weakness, buzzing in the ears and pain in the left ear. Gait was uncertain, neck slightly stiff, pulse slightly irregular, but there were no other signs of note. In the days following he grew worse. He fell into a soporific condition from which he could scarcely be roused by calling to him. Groaned at times and complained of pain. No vomiting. Temperature fluctuated from 37°–38° C. The head was bent backward and opisthotonos was well marked. Kernig's sign very plain in both lower extremities. Pulse somewhat slowed (70 with 37.6°). Urine contained 0.5 per cent albumin and some epithelial cylinders. Lumbar puncture gave discharge of cerebrospinal fluid under heightened pressure, clear, transparent and containing 140 lymphocytes per c.mm. Nonne-Appelt reaction slightly positive. After this patient's condition improved. The pain diminished, also the stiffness of the neck. Somnolence continued as before. There was also motor restlessness (tremor-like plucking movements). Lumbar puncture repeated, giving fluid of same character as before. Motor restlessness then became less. Improvement slow but constant. Temperature sank to normal, urine lost pathological quality. The drowsiness remained longest and apathy existed in a peculiar association with motor restlessness. About the middle of February recovery could be considered complete.

Case II. W. K. Girl. Seventeen. Became ill at the end of January with general distress. Elevation of temperature for five days, 37° – 38° . Twice reached 39° . Complained of headache, catarrh, buzzing in the ears. The peculiar psychic condition was the most striking when she was examined a month after the beginning of the illness. She was drowsy, apathetic, scarcely paid attention to the questions put to her, moaned at times, wept softly by herself. The internal organs revealed no special anomalies. Sensibility normal, tendon reflexes exaggerated. Paresis of right facial nerve. No clear paralysis of the eye muscles yet patient complained of double vision. As the somnolence continued motor restlessness developed. Patient could not lie still, atypical irregular twitchings, in hands and feet. Still later the restlessness was displaced by a peculiar general rigidity. In the following weeks paralysis of all branches of the right facial nerve was sharply marked, strabismus. Adiadochokinesia in both hands. At the end of March marked general improvement. Facial paralysis slight, but somnolence and catalepsy-like rigidity remained.

Case III. M. L. Male. Fifty. Became ill toward the end of January with pains in both lower extremities of such violence that patient had to cry out almost continually. Temperature fluctuated between 37° and 37.3° . Cause of pain not discovered in examination. Nerve trunks not sensitive to pressure, no objective disturbances of sensibility. Aa. dorsales pedis and Aa. tibiales posticae very palpable. Tendon reflexes somewhat exaggerated. Narcotics in large doses without effect. The pains persisted for three days. Then paresthesias arose with pains at times which now the patient could locate higher in the hip region and the back. Temperature began to rise and remained 37.5° – 38° , reaching even 38.5° . At the same time the family were astonished by the drowsiness and apathy of patient. Restlessness soon after with plucking at the bedclothes, his clothing, pulling of his hair, scratching himself, etc. Range of movements mostly limited. Delusional ideas in the second week of illness. Illusions also and hallucinations, delirium of a melancholy nature causing him anxiety. He begged that the strange fellows who were trying to get at him should not be let in. Asked excitedly what all these people wanted of him. Motor restlessness still more marked. He rubbed, scratched and tore his skin until it was sore. In the third week the facial paralysis which had already affected the right side became more marked. Anisocoria also. Tendon reflexes exaggerated before could now be called forth only with difficulty. Retention of urine as a new disturbing symptom so that the catheter had to be used regularly. Temperature fluctuated about 37° (36.5° , 37.1° , 37.2°). Condition improved toward end of first month. Sensorium clearer, hallucinations disappeared, also delusional ideas. After two weeks more the catheter could be dispensed with. Continued though slow improvement. Persistence of the very severe

pains in the extremities which the patient could not locate at all exactly. Nerves showed the same sensibility to pressure as the muscles did.

Case IV. Ch. F. Female. Twenty-three. Scarlet fever in childhood which had left an affection of the ear. Patient became ill the middle of December with violent pains in head and neck and pain in the region of the left ear. High temperature for five or six days but not above 38° . Examination December 20 revealed patient in a forlorn condition. She suffered especially with violent pains in the left ear and the left extremities, chiefly the leg. Tendon reflexes greatly exaggerated. Nerve trunks insensible to pressure. Sensibility not diminished but rather slight hyperesthesia to the left, slight yet distinct paralysis of the left facial nerve and left abducens nerve. Pulse rapid. Systolic murmurs of the apex of the heart. No anomalies could be found in the ear. Ophthalmoscope revealed very marked paleness of the optic disk. The violent pains in the left half of the body continued unaffected by injections of morphin. Patient complained of great dizziness and could scarcely hold herself upright during examination. Plain ataxia of the left upper extremity. No pathological reflexes. No paralysis in the extremities. Blood test gave slight leucocytosis (11600 per c.mm.), relative number of various leucocyte forms was approximately normal. A few days later only 6500 leucocytes per 1 c.mm. Improvement began in the third week of illness. Temperature which had shown an irregular rise to 38.6 became normal. The pains became more bearable and then disappeared. Paralysis of nerves VI and VII became less distinct. Movements could be carried out without dizziness. In the sixth week only general weakness remained.

Case V. E. P. Girl. Twelve. She had gone through chorea minor some years before. Early in January she became ill with headache, catarrh, buzzing in the ears and pain in the left ear. Aural report negative. Temperature varied from 34.5° to 38.5° , once reaching 39° . On the fourth day extraordinary drowsiness. Patient awakened for nourishment only with difficulty, falling asleep again immediately. Involuntary urine. Slight twitching in various parts of the body. After some days the temperature dropped to normal. There was paralysis of a peripheral type in the left facial nerve. The tongue deviated toward the right. There was double vision and a nasal character to the speech. Swallowing difficult. Somnolence somewhat less. A few days later complete paralysis of the left upper and lower extremities and partial paralysis of the right. Tendon reflexes greatly exaggerated. Left foot clonus. Babinski on both sides. Speech difficult (dysarthria). Temperature varied during the entire period 36.5° – 37.5° . Normal in the fourth week. No paralysis at the right. Tongue straight. Marked improvement in the paralysis at the left, left facial paralysis also less pronounced.

Patient more cheerful, spoke and swallowed well. By the middle of April went out and performed light tasks. The facial paralysis was still evident. Chiefly, however, one was struck by the masklike expression of the face, the general rigidity and stiffness of the body. All movements were strikingly slow and automatic in character.

Case VI. M. Tsch. Student. Nineteen. Became ill February 5 with indefinite symptoms. Soon double vision and motor restlessness especially marked in the left arm. The restlessness was that of a series of initial stages of various voluntary movements. Stubborn insomnia. Temperature began to rise February 8. (See temperature curve.) After three days patient complained of severe pain in the right knee joint which later attacked the entire extremity. Morphine injected without effect. Patient feared to be touched or moved lest pain should be increased although he could easily be persuaded that the moving of the knee or other joints or pressure upon the sore spots produced only the slightest increase of pain. Delirium and hallucinations in the days following with more marked somnolence. February 13 distinct ptosis, left. February 18 temperature normal. The somnolence persisted. Marked improvement the next week. The ptosis disappeared, pains much less.

Case VII. L. B. Female. Thirty. Became ill January 18 with catarrh, pain in the head and fever. Temperature 37.5° – 38.5° , twice reaching 39° C. Normal after five days but before this double vision and dizziness, somnolence and motor restlessness which was located chiefly in the right extremities. This condition lasted about six weeks with almost the same intensity. Ocular examination revealed mydriasis and paralysis of accommodation of the right eye and paleness of the right disk. At the end of March patient only complained of general weakness.

Case VIII. T. P. Male. Forty-nine. Became ill the beginning of January with catarrh, coughing, weakness, fever. Two weeks later when the temperature already was almost normal severe pains appeared in the head, neck and extremities. Pains diminished at end of the month but somnolence, delirium, hallucinations appeared. February 3 with a normal temperature, slight facial paralysis, left. February 9 complete paralysis of the left facial nerve in all its branches. Sensorium clear. General condition satisfactory. Facial paralysis disappeared a month later and patient felt well.

Case IX. L. P. Girl. Seventeen. Became ill January 16 with severe pains in the left ear and slight fever. Aural examination revealed nothing pathological. After some days somnolence and double vision. Temperature fluctuated between 37° and 37.5° C. Somnolence less the next week. Diplopia remained now associated with strabismus (paresis of the left rectus internus). Then there developed paralysis of the left facial nerve unequally marked in the different branches. Frontal branch little involved. General condition soon improved, somnolence less. Facial paralysis most prom-

inent symptom. At times also difficulty in swallowing which soon disappeared. Diplopia also disappeared toward the end of February. Facial paralysis merely indicated, only the strabismus remaining.

Case X. Ch. G. Female. Twenty-five. Had suffered typhus since November but had recovered. The middle of January began to have pains in various parts of the body. Somnolence at same time. Seemed very ill when first seen January 29. Much stupefied, moaned and tossed about. No paralysis, no opisthotonos. Temperature 38.5° C. Lumbar puncture made that day. Fluid flowed rapidly and under heightened pressure but of normal consistency. Condition unchanged the next day. Death toward evening.

Case XI. P. B. Male. Forty-five. Became ill the beginning of January with catarrh, slight headache, pain in some of the joints. Somnolence, confusion, delirium and hallucinations in the second week of illness. Headache became very severe. Examined first January 20. Paresis of the inferior branch of the left facial nerve, increase of tendon reflexes, suggestion of Babinski, typical at left. Marked stupor. Pronounced motor restlessness as described above, frequently also simple tremor. Lumbar puncture the same day. Only a few c.mm. of fluid obtained containing 12–15 lymphocytes per c.mm. Lumbar puncture repeated next day gave about 60 c.cm. of fluid appearing under increased pressure, normal in consistency. Condition of the patient remained unchanged. Worse toward end of the month. Complete loss of consciousness. General rigidity. Death February 1.

Case XII. R. G. Female. Forty. Became ill the end of January. Typhoid suspected at first but temperature did not go above 38.5° C. A pustular eruption appeared in the very beginning at the left side of the back parallel with the border of the ribs, herpes zoster. Patient in stupor, confused; hallucinations. February 2 paresis of left facial nerve, anisocoria, right pupil larger, sluggish pupillary reaction. Toward end of second week retention of urine. Catheterization necessary. Movements of violent restlessness which caused many excoriations of the skin. Temperature normal. Death in third week.

Case XIII. Girl. Seventeen. Became ill the middle of January with headache, catarrh and moderate fever. Temperature normal after a week, rising now and again to 37.3° . General weakness set in, somnolence, motor restlessness. Double vision. Improvement the middle of February. Patient stronger, somnolence less. A passivity remained foreign to patient's previously lively character. February 28 temperature rose to 37.5° then to 38.9° C., severe pains in region of stomach. Temperature soon dropped but at the same time patient's general condition became much worse. Strabismus appeared (paralysis of the right M. rectus internus), also partial paralysis of both facial nerves, especially of the right. Speech took on a nasal character, swallowing was difficult. Improvement after some days.

The strabismus was now less marked, the paralysis less, speech normal. Apathy and flaccidity of movement remained. Face mask-like, its expression or rather lack of expression resembling the faces of demented persons. Movements very slowly carried out as if against the will or through the overcrowding of some hindrance. Alteration of direction of movements, especially ponderous and slow (peculiar *adiadochokinesia*). By the middle of March these symptoms also had yielded and the patient was more active.

Case XIV. L. B. Girl. Sixteen. Became ill with influenza the end of January. Temperature never reached beyond 38.5° C. Some days after it had fallen severe pain appeared in the chin extending later to the upper extremities. At the same time hallucinations, delirium, marked somnolence. Both facial nerves were partially paralyzed, the right more than the left. Fever again. Typical motor restlessness. Lumbar puncture February 11. Bloody fluid was discharged which after centrifugation took on a light yellow color. Fluid similarly bloody with two punctures, one between lumbar vertebrae III-IV, the other between IV-V. Death two days later.

Case XV. M. M. Male. Fifty. Became ill with influenza in the beginning of February. Catarrh, cough, headache. Temperature fluctuated between 37° - 38° C., once reaching 39° C. Normal a week later. Still the patient felt very ill. Could not hold himself upright and was very sleepy. Confusion in third week. Patient rambled on seeming to hallucinate. At the first examination, February 25, mask-like expression of face striking. Bilateral ptosis greater at the left, paresis of both facial nerves. Tongue could be protruded only a little way and with great difficulty. No paralysis in extremities. Sensibility normal. Patellar and Achilles reflexes absent on both sides. Respiration very rapid. Lumbar puncture next day. Forty-five c.mm. of fluid obtained containing 0.6 per cent albumin and 6 lymphocytes per 1 c.mm. At the following examination, March 1, improvement, sensorium clearer, paralysis of the right facial nerve barely evident, tongue protruded further and more readily, ptosis only at the left. Achilles reflexes present. Severe pain in extremities though nerve trunks not more sensitive to pressure than the adjacent tissue. Later psychic condition improved, but the pains continued for a long time in the same intensity, still very distressing at the end of April. Ptosis at the left still noticeable, patellar reflexes still absent.

Case XVI. M. L. Female. Thirty-three. Brought from the country the beginning of March. Had become ill a few months before with violent pains in the head, general weakness and weakening of memory. Had vomited several times. According to the husband's statement temperature had risen only once during a protracted constipation but became normal as soon as castor oil had produced an effect. Examination, March 12, showed a very sick patient. She could not hold herself upright, moaned, responded to questions only with difficulty and in monosyllables. Tendon reflexes mod-

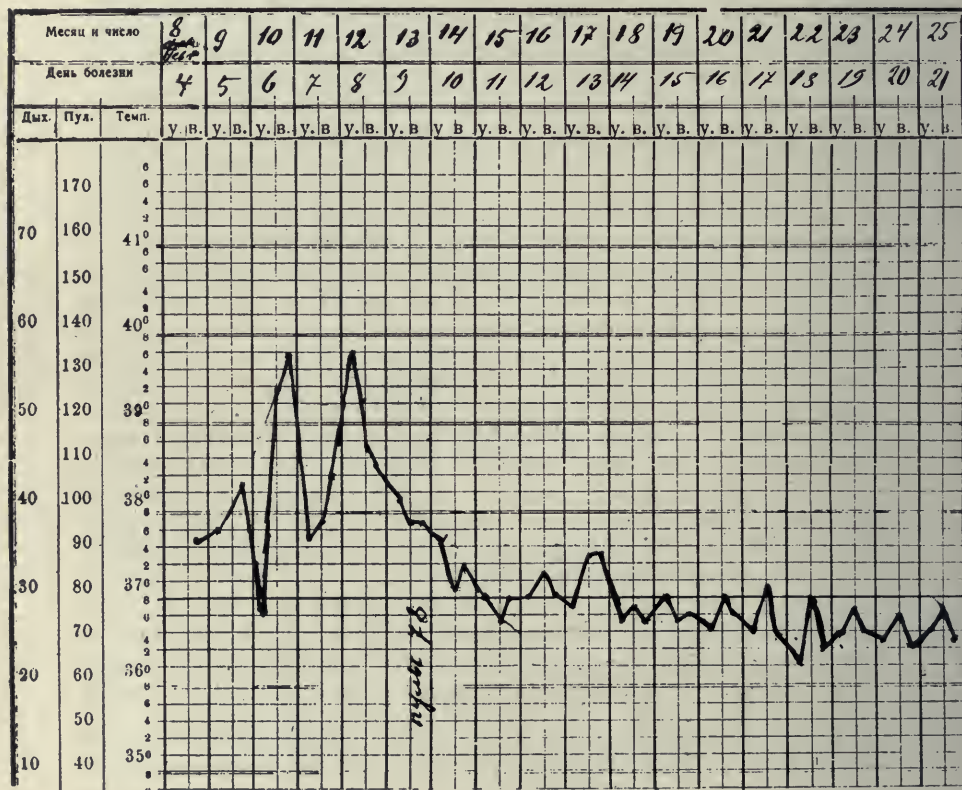
erately increased. The narrow pupils reacted sluggishly to light. Left abducens nerve partially paralyzed. Double vision and weakness of vision. Ophthalmoscopic examination showed choked disk and retinal hemorrhage. Urine normal. In the days following temperature rose every evening to about 37.5° . No further diminishing of vision, increase of the choked disk. Lumbar puncture at this time because the suspicion of cerebellar tumor, which would have contra-indicated thin procedure, seemed now unfounded. Fluid discharged under heightened pressure was of normal constituency. Hereupon condition markedly improved. *The headaches disappeared completely. The apathy receded.* The previous mask-like expression of the face changed to a more lively one. Ocular examination showed improvement of vision and decrease of the choked disk. By the middle of April patient well enough to return home.

Case XVII. S. D. Male. Twenty-five. Came from the country in the seventh week of illness with this report from his physician. He became ill February 20 with headache, many indefinite signs of illness. Fever first five days 37.5° – 38° C., slow pulse, 40–50. When the temperature was normal somnolence and motor restlessness appeared. Delusional ideas and hallucinations which lasted only a short time though the somnolence persisted throughout the illness. Examination April 9 revealed partial paralysis of a central type of the right facial nerve, slight anisocoria, tendon reflexes exaggerated more at the right than the left. Headaches which had persisted in violent form all through the illness still felt, particularly on the left side. Patient's stiffness of position and his mask-like expression most striking. The latter could not be due to the slight paralysis of the left inferior facial branch. Patient was glad to remain in one position and his movements were rather clumsy and mechanical. He reminded one of catalepsy but the psychic condition was intact. Slow improvement in the following weeks.

The author reviews his material as follows: In general the first symptoms are slight general disorder, never very high fever, catarrh, various pains. Some days later there appear somnolence, which may reach a profound degree, in many cases hallucinations and delusional ideas. Almost always there was diplopia, often strabismus, paralysis of nerves VII and XII, more rarely paralysis of the extremities and vagus symptoms. In some cases opisthotonos and Kernig's sign were established. Often there was general rigidity. The cerebrospinal fluid flowed under increased pressure at lumbar puncture usually showing increase of structural elements with increased albumin content. The pain, the earliest and most typical symptom, was peculiar in character and variously located, in the top of the head, temples, neck, one arm, one-half of the body, the legs, more rarely changing from one place to another. The pains were so

intense that even adult patients ordinarily self-controlled would cry out by the hour. The pain did not follow the nerve trunks nor were these especially sensitive to pressure. Morphine and other narcotics were of no avail. For this reason the pain suggested that occurring after hemorrhage in the region of the thalamus opticus. Doubtless it was due to central stimuli. Sensibility in almost all cases was normal. Paresthesia was often present.

M. Tib. (Fall 17)



TYPICAL FEVER CURVE.

Temperature showed elevation at the beginning as a rule only slight and of brief duration so that the disease in its longest and usually most severe period was without fever. Usually a slight increase was present throughout the course. The somnolence which was noted in the first days may be counted almost as a pathognomonic symptom. It even reached a stupor. The patients had to be wakened for food and medicine and could not be kept clear in mind, even

when psychically intact. The course of the somnolence varied. A condition of excitement sometimes followed, sometimes accompanied it, when hallucinations and delirium were present. The patients saw acquaintances but were apathetic about it and easily convinced of their error but readily returned to conversation with the imagined persons. Sometimes the forms seen took on a more frightening aspect so that the patients begged for protection. Apathy and somnolence were therefore bound together in a peculiar manner with states of excitement, hallucinations and delusional ideas. In contrast to Korsakow's syndrome the memory was good even for recent events.

The motor symptoms were those of excitability as well as of failure. The former usually appeared first. The motor restlessness was curiously combined with the somnolence. The movements often suggested those of chorea. They appeared as remnants of purposeful movements as if the patient had changed his mind when the movement first intended was half completed and either interrupted the new movement or forced it to its opposite. Tic-like movements were seen in some cases, in others a simple tremor. Ataxia of a cerebellar character was present in very many cases. Typical and atypical adiadochokinesia was sometimes observed.

A characteristic stiffness was evident in a considerable number of patients which gave their hearing and facial expression a similarity to that of patients suffering from paralysis agitans. In other cases or on other days the expression was rather that of demented individuals or those suffering from myxedema. The patients carried out their movements slowly and with great effort as if under great resistance. Facial expression and movements showed lifelessness. Eating and masticating were carried on with exasperating slowness. The patient could smile only with difficulty but then a distorted smile remained for some time.

Symptoms of motor defect appeared first in the muscles of the eye. Almost all of the patients complained of double vision. Soon strabismus appeared which represented paralysis of the muscles innervated either by the VII, IV, or VI. Ptosis, inequality of the pupils and sluggishness of the pupils were also present. The general ocular condition was usually normal but in two cases examination revealed pathological paleness of the disks, and in another choked disk and retinal hemorrhage. Of the other cranial nerves the facial was most frequently affected usually in all its branches. In a few cases there was temporary facial diplegia, which interfered typically

with the production of labial sounds. Of course, in such cases the face was mask-like although this mask-like expression was present more often without the facial affection. Even the facial paralysis that seemed very severe disappeared remarkably soon. The acoustic affections so frequently observed in typhus were not observed here. Paresis of the hypoglossal nerve was occasionally observed, sometimes unilateral so that the tongue deviated to one side when it was protruded, sometimes bilateral when generally protrusion was almost impossible. In some cases there were very distressing disturbances of breathing and swallowing.

The extremities often showed great weakness but much more rarely true paralysis. There was a leftsided hemiplegia in one case with the peculiarity that all branches of the facial nerve were affected and that the right half of the body was not entirely unaffected (pons affection). In many other cases the paralysis had a spastic character, exaggeration of tendon reflexes, foot clonus and Babinski. Again in other cases the tendon reflexes were very much reduced or entirely absent.

With some patients there were very marked meningeal symptoms. Slowing of the pulse was very rare but stiffness of the neck and Kernig's sign were more frequent.

There appeared to be an increased vulnerability of the skin, burning by cataplasmata and deep skin wounds were very frequent. One case showed herpes zoster.

Urination was frequently disturbed usually in the form of rather stubborn retention so that catheterization was necessary. Incontinence was more rare and then due to the stuporous condition of the patient.

Cerebrospinal fluid was usually clear, flowed rapidly under heightened pressure in large quantities and contained an increase of albumin (up to 1 per cent). Nonne-Apelt reaction was only once weakly positive. No decrease in glycoside substances could be demonstrated. The number of structural elements for the most part was increased, always in form of lymphocytes, 6, 15, 38, 140, even 240 lymphocytes per c.mm. Sometimes the fluid was normal. Pathogenic microorganisms were not present, never the Pfeiffer bacillus. In one case the fluid was bloody.

The course of the illness varied considerably. In many cases the stage of stupor, somnolence, delirium, hallucination and involuntary movements was merely indicated. These symptoms lasted only a day or so and the entire clinical picture was that only of a slight

ataxia and partial paralysis of one or the other cranial nerves which entirely disappeared after two or three weeks. In other cases the stage of psychic disturbances lasted for weeks, all of the symptoms were severe but recovery or a condition approaching recovery was reached. Death occurred in only 7 of the 40 reported cases, or in 17.5 per cent of the cases. It resulted in the second or third week, once in the fifth week. Autopsy doubtless would have found the substratum of the illness in an inflammatory affection of the brain. This may be assumed from the psychic symptoms, the somnolence, hallucinations and delusional ideas, headaches, disturbance of vision, paralyzes of cranial nerves, ataxia, the involuntary movements. The condition of the cerebrospinal fluid, the bladder disturbances, Babinski's phenomenon point to an affection of the central nervous system. Nothing but inflammation, an encephalitis, could cause all the pronounced symptoms. Such an encephalitis is a rare disease; when, therefore, so large a number in a few months manifest symptoms of a peculiar form it must be epidemic. The cause was at first diagnosed as influenza, catarrh of the mucous membrane preceding the other symptoms. In two cases other members of the family were ill with influenza but only one member in each family with this encephalitis. The question arises, since no Pfeiffer's bacillus was found, whether we have not to do with an infection *sui generis* which in its initial stage shows likeness to influenza. The cases of encephalitis gripposa described in the literature do not correspond to those either in the features here given or in the favorable course. Yet the contact of these patients with those undoubtedly suffering from grippe, also the initial stages of the infection show a connection of the epidemic with influenza.

Oppenheim in his monograph on encephalitis (Nothnagel's "Spezielle Pathologie und Therapie," Vol. IX, T. II) warns against considering light cases with isolated symptoms as influenzal encephalitis. This may in general be correct and one may agree with Oppenheim that the diagnosis "encephalitis" often is made too quickly. Yet here is an epidemic with cases ranging all the way from severe ones with all possible symptoms to slight ones with individual cerebral symptoms where the inclusion of even these lighter cases under encephalitis is justifiable.

It seems an established fact that occasionally encephalitis appears as a complication of influenza. Nauwerck first showed that the influenza bacilli penetrate the brain and even there produce changes characteristic of encephalitis, hyperemia, capillary hemorrhage and

small foci of inflammation. It is no contradiction of this fact that autopsy in many typical cases gives negative results. The term encephalitis is used here to denote that the most important and most typical symptoms were caused by the affection of the brain. Yet in fact the inflammatory diseases of the nervous system are only most rarely confined to definite portions of the nervous tissue. In anterior poliomyelitis the affection extends beyond the region of the anterior horns, in polyneuritis there are pathological alterations also in the central nervous system, in meningitis the adjacent brain tissue chiefly is involved in the inflammatory process. It can be well understood, therefore, that in encephalitis gripposa occasionally the meninges, the spinal cord or certain peripheral nerves may be involved. The stiffness of the neck, Kernig's sign and the condition of the cerebrospinal fluid point to meningeal involvement while the facial paralysis often had a peripheral character, although sometimes a nuclear affection was possible. Failure of tendon reflexes and atrophy of the muscles of the extremities were best explained as affection of the anterior horn cells. The fact that skin sensibility remained intact in the affected areas as well as the pressure sensibility of the nerve trunks excluded affection of the peripheral nerves. The pains suffered were not neuritic in character. It was therefore, in many cases, among other things, the cerebral meninges, portions of the spinal cord and peripheral nerves which were attacked with chief location of the disease process in the brain.

As to the most exact cerebral localization the predominance of the general symptoms, somnolence, delirium, motor restlessness, etc., point to a diffusion of a toxic disease process while other symptoms suggest the presence of very widely separated disease foci. The nuclear regions of cranial nerves III, IV, VI, seemed to be particularly affected as they are in Wernicke's polioencephalitis superior but here the VII and XII were also attacked. Vertigo, ataxia and nystagmus are symptoms of the cerebellum or of the brachia cerebelli.

Case IV, in the symptoms of strabismus and tremor, ataxia, parasthesia and violent pains on the left side, showed the picture described by Raymond and Cestan as syndrome of the superior protuberance. The pyramidal tracts were affected sometimes chiefly in the brain stem.

The chorea-like motor restlessness of the early stage of the disease and the later rigidity which resembled paralysis agitans were probably the reverse picture of the pathological functioning of one and the same mechanism. This is a mechanism located in the extra-pyramidal

tracts, especially in the corpus striatum, to preserve the harmony and elasticity of the movements brought about by the aid of the pyramidal system. In one case there would be confusion of movements, with muscular contractions which confused and distorted the voluntary movements, in another severe inhibition of these movements. Therefore there was probably affection of the corpus striatum and associated areas.

These cases are distinguished from those in the literature first through their epidemic appearance. There was never established direct transference, however, from one patient to another nor was the disease found to prefer definite regions of the city. No predisposing causes could be ascertained from the patients. The marked motor restlessness and chiefly the catalepsy-like rigidity were more pregnant pictures than any found in literature. The course also was so much more favorable than in the published cases of encephalitis which could be consulted. Oppenheim emphasizes the fact that frequency of recovery in influenzal encephalitis is not uncommon, yet one gets an impression from the literature that such are rare. According to Spielmeyer (cited according to H. Vogt: "Encephalitis non purulenta," in Lewandowsky's *Handbuch der Neurologie*, Vol. III) complete recovery was noted only twice in 36 cases of Wernicke's polio-encephalitis while death occurred in 24 cases. Other instances of encephalitis do not offer a much better record while here the mortality was only 17.5 per cent.

Diagnosis was difficult only at the beginning of the epidemic. In one case, XVI, the symptoms suggested brain tumor, which diagnosis was excluded, however, by the presence of the epidemic and by the mask-like character of the face.

Therapy had to be chiefly symptomatic. Antineuralgic and narcotic drugs were without effect upon the pain. Very warm baths brought decided relief. In the stage of excitement bromid, hyoscin and pantopon were given with tepid baths. In the somnolent stage the skin and mouth were well cared for and bed baths given. Sometimes large quantities of physiological saline were given subcutaneously, usually producing a good effect immediately. In severe cases lumbar puncture was carried out and collargol given by enema. These measures certainly had good results in some cases.

TRANSLATIONS

EMOTION, MORALITY, AND BRAIN*

BY PROF. C. V. MONAKOW

ZÜRICH

(Continued from page 363)

The conduction paths and stations for pain on the surface of the body, and those for the various visceral emotions, are indeed referred from the periphery of the body, or from the inner organs and ganglia, to the spinal cord, and in so doing, make use of distinct anatomical conduction paths. At the same time, if for instance the "preferable" paths in the spinal cord are blocked, they can still be guided to the cortex—so long as the primary centers or nuclei are not destroyed on both sides (for instance in the mid-brain or thalamus—and also at such times it is a matter of indifference what supra-nuclear and locally limited conduction paths are interrupted. Moreover, when there are cortical defects, pain and pleasure, feeling of tension and release, together with earlier earned emotional possessions (complete emotional values) can be awakened and stimulated from the periphery and inner organs, so long as convolutions provided with sound cortical substances are present. At any rate, all experimental interference, which has as its aim proof of an "island-like" localization of the emotions, as Gall and the phrenologists once had a naïve notion of them, are totally demolished; even brain pathology (theory of localization) has furnished at no time facts of value supporting the view that there are definitely circumscribed "emotional centers." However, against efforts to exclude all and every localization of the emotions in the cortex, the fact must be kept in mind that defects and diseases of a definite convolutional section in the cortex, injure certain emotional forms more severely than other forms (effects of diaschisis). In this connection I recall the observation by Goltz on appreciable character changes (definitely heightened reflex irritability) in dogs whose frontal brain had been excised (Munk found, to be sure, no corresponding disorders in the Macacus), and observed especially in tumors of the frontal brain (even on one side) the so-called "Witzelsucht," and

* Authorized translation by Gertrude Barnes, A.B., and Smith Ely Jelliffe, M.D., of the authors Gefühl, Gesittung und Gehirn.

changeable moods in the patient, etc. These symptoms certainly possess a definite although slight diagnostic value. Such phenomena can arise, it is true, in connection with foci otherwise localized in great brain centers. Assuredly it is a question here of no law, and these facts do not prepare us to ascertain whether with tumors still other, only indirect moments, standing in relation to the localization, do not play an important rôle. I have now in mind the chemistry of the blood and disordered glandular secretion.

Herewith I proceed from localization in the cerebrum, which at least has only a minimal significance in relation to the higher emotions, according to my present view, to another consideration, which bears upon the development, that is, the activities or richness of the emotional world, and to which a rôle at least as important as innervation in the narrower sense (conduction, storing up) is to be assigned. This point is related to inner secretion and the composition of the blood, as just pointed out. I need not here detail how the whole sexual life, the search for nutriment, that is, the desire for taking in food, then the love of adventure and battle, the emotion realized through possessing strength and advantage, etc., is inconceivable without participation of the glands of the genital apparatus, the great abdominal glands, the adrenals, the thyroid, the hypophysis, the epiphysis, and without the blood elements so closely connected with these glands, a fact which is to-day generally admitted. Less familiar at the same time, is the morphological, that is, the historical and evolutionary side of the whole question, especially regarding the somatic side of the emotions.

We now proceed from the proposition that for the "world of sensation (in contrast to emotion) and motion," that is, for spatial and temporal orientation, the chemical constitution of the blood is of relatively trifling significance (blood containing oxygen only being necessary). This assumption also wins valuable support from morphological considerations. Soon after the first differentiation of the ectodermal cells, for instance, already in the phylogenetic grade of the "turbellarian," we see a tolerably well marked organization of the nerve cells into an exteroceptive, sensory and motor organs) and into an interoceptive structure. The first occupy, upon the whole, more the outer, the latter more the inner parts of the body. Already at this stage one can identify here and there, especially in the region of the last mentioned part, vesicle-like cells without nerve characteristics. These cells by their armature and their light yellowish pigment suggest certain elements in the adrenals

of mammals. According to Kohn similar cells are found in the so-called chromaffin system and stand in the closest relation to the sympathetic. These cells are brought in close union with the adrenals, and are considered as homologous elements of this as well as of the chromaffine system. In the human fetus, one finds already at two months an advanced foundation for the adrenal, and this is separated only very slightly from the gangliar rudiments of the abnormal organs. Perhaps in the body wall of the turbellarian worms still other cells are present, which represent preliminary structures of the other blood glands (thyroid, hypophysis).

In considering the structural connections in the body of that animal, the idea now arises that—from those Leydig cells—certain chemical materials (adrenalin and related bodies) are conveyed to the nerve cells in the inner wall of the gut, to the small sensitive elements, as well as from the “granules” (“satellite cells”) collected here, which are, on the whole, scanty in number. These chemical materials are of the greatest significance for the whole nervous economy of the animal. At any rate it seems highly probable that a coöperation of certain secretions of the blood glands derived from chemical combinations is still necessary to a stimulation of the sensitive cells constituting the real foundation for the visceral emotions, besides the stimuli proceeding from the inner wall (interoceptive). Furthermore, the so-called visceral emotions at least represent the product of the mutual, that is, reciprocal influence of the two cellular systems referred to above; *i.e.*, of the nervous cellular system and that of the blood glands. In my opinion, a chemical participation proceeding from the glandular apparatus would be necessary, consequently, to the “birth” of the “visceral emotions”; also it is very probable that the corresponding chemical combinations are indispensable to the production, that is, the excitation, of certain fundamental somatic emotions in the human cortex.

Of course a powerful component of the emotions (and of the elemental “will”) both individual and collective, will reside in the primitive sensory cells, and their dependents in the ventral passage wall of the animal, and already here represent a certain unity of the somatic emotional life, in particular, pleasure, dissatisfaction, tension, release, want of food, sexual impulse, and so forth (in manifest and in latent forms). For continued action, that is, for the flow of life, the components certainly still need the coöperation of definite still unknown elements which supply specific chemical ingredients. These elements (already at a very low phylogenetic stage) have been dif-

ferentiated from the general living protoplasm of the unicellular animals.

On higher phylogenetic levels the two systems, namely, the somatic and the visceral nervous system (even upwards to the optic thalamus, or the floor of the third ventricle) lead a fairly separate existence, the relative pathways running separately for the most part (only in the cortex does a close union take place). The blood glands, becoming differentiated by degrees from the Leydig cells, and filling the biochemical rôle in the function of the visceral nervous system, are connected only with the sympathetic and the autonomic nervous system (also morphologically through nerve fibers and fibrillar bands), just as the cerebrospinal system is likewise connected histologically with the sensory surface and the muscles. First in the mid-brain, or in the cortex, the corresponding paths and centers join; and in the cortex it is probable they join in such a way that the representatives of the sympathetic and the autonomic systems (sensory motor cells and cells which store up impressions of stimuli) are distributed over the whole cortex, most abundantly, to be sure, in the various well characterized "sensory spheres." Where the representation according to limbs and sensory organs is most pronounced paths go out to the various inner organs, in a particularly abundant manner. Their functional strength may be represented more through collective functioning of the N-cells (mnemic activities) than through participation of particular, specific individual cells.

The diffuse modes of disseminating visceral stimuli in the cortex may easily be imagined as mechanical in such a way that every stimulus complex from the abdominal organs as it becomes manifest, when through the mediation of the inter brain it has passed into the cortical conduction paths or to a certain favored part of the cortex, is distributed as soon as it enters the cortex and is inscribed in the cell groups as by the operation of a pantograph provided with numerous pencils, as soon as the proper lever is put in action.

Such a diffuse inundation of the cortex by "emotional stimuli" may be indispensable, in order that every impression (element of experience) corresponding to an original sensation may be provided with the "emotional quota" belonging to it. But of course these are only hypotheses!

The influence upon one another of the sympathetic, autonomic, and chromaffine cells, or blood glands, requires a clearer elucidation by application of a few modern pharmacological and cyto-physical experiences. In the reciprocal exchange (taking in and giving out)

of certain materials in the visceral sensory cells, the chromaffine cells, and the blood, may perhaps be sought the material basis for the life of the instincts, especially for the tension and discharge of the emotions. Osmosis, that is, the osmotic pressure, may here be granted a deeper physico-physiological significance.

Primarily there is implanted, at least theoretically, in every isolated living cell, the capacity to maintain itself from within, although only for a very short time, and probably even to produce germinal "emotion." As soon as the division of labor has begun in the multicellular organism, then for every distinct functional form as we have already seen, distinct tectonic "specializations" are provided (through successive engrammes), while in doing so the fundamental coherence between the single cell-groups, that is, a certain primary grouping, is not abandoned.

The organization of the higher emotional life now might evolve, in my opinion, on an entirely similar basis. In the division of labor and differentiation of the nerve cells, very probably, the chemotactic and the pharmaco-dynamic, that is, chemism, plays no subordinate rôle, a fact which may be assumed from the perfecting and thriving of the individual animal. The special organs are created at this period. At this point, one may call attention also to the results of investigations by Overton and H. Mayer on the osmosis and in particular on the narcosis of the cell. According to H. Mayer, one can differentiate autonomic and sympathetic forms of end-apparatus by the pharmacological reaction. The autonomic react especially to the cholin groups, and are paralyzed through atropine. The sympathetic are stimulated through adrenalin, pituitrin, and cocaine, but paralyzed through nicotine. Cholin is an ingredient in lecithin and in cell lipid. Psychic stimulation excites the sympathetic nervous system, whereby an inundation of blood with adrenalin takes place through the mediation of the splanchnic tissues. Cocaine and atropine on the other hand create psychic stimulation; morphine, alcohol, opium, chloroform, antipyretics, etc., on the contrary, produce quieting effects.

The points of attack for the pharmaco-dynamic substance in question here are to be sought especially in the old phylogenetic, autonomic, and sympathetic nerve cells, as well as in the spinal ganglia. The other, that is, the kind of nerve cells assigned more to the "orientation apparatus," behave in a refractory manner to most of these chemical substances or are even passive at least to small doses of them. The narcotics have the peculiarity that they dissolve the lipoids of the sorts of cells just mentioned; in any case, this

applies to the effects of alcohol, chloroform, morphine, etc. In this way, favorable conditions are provided for osmosis. The operation of these remedies is first of all shown in the fact that they deaden pain temporarily and then produce sleep. In many nervous areas they reduce tension, and promote the feeling of relaxation, soften the collision of emotional currents, and bring us rest. Still other effects, too, namely, such operating in the cellular membranes, can be considered in this connection: facilitated supply, perhaps also the delivery of ferments, enzymes or poisons acting as ferments in the cellular complex falling under consideration, probably within the various "excitable regions"; from the nerve cells of the autonomic and cerebrospinal ganglia all the way up the long succession of the descendants of these, migrating corticalwards in the course of phylogenetic evolution. After a certain time, the narcotic influence, as is well known, introduces as a secondary reaction, general fatigue and probably nausea as well. Could not a protracted secretion and expulsion of the discharged products peculiar to the cell, and the demand of the cellular protoplasm for restoration to biochemical equilibrium, correspond to this condition?

The instances just now discussed bring before us the following question: Might it not be possible that substances setting free lipoids and facilitating supply of ferments (just as with the narcotics) could be produced in our body regularly, that is, according to law and need; and for the production of such substances would one not take first and foremost into account the internal secretions, that is, the hypophysis, the adrenals, the thyroid, the epiphysis, the epithelial bodies, or the chromaffine system? Moreover, the sexual glands certainly would come into question at this point. The continued coöperation of these glands in the development and growth of the various organs of the individual could not be doubted at any rate. They could produce suitable chemical materials (sperm, etc.) according to requirements (periodic) just as the adrenals produce adrenalin, as the thyroid, thyreoglobulin, etc., and supply such secretions to the central nervous system according to the measure of the need of the nervous elements in question, in part through the cerebrospinal fluid (after filtration in the choroid plexus), and so in appropriate ways come into use in the development of the sexual emotions. Would it be absurd to assume that such secretions stimulated through phenomena in the interior of the body, as well as through outer stimuli (experiences) would supply the chemical basis for the feeling of fatigue, for sleep, for euphoria, for the need of food, and for many other appetites? (Material basis for fatigue, for

intoxication, for excitation of libido?) In my opinion, no. Such an assumption for sleep and activities of the sexual organs has long been discussed but is lacking none the less in positive evidence and demonstration. Beyond adrenalin, pituitrin, thyreoglobulin (Oswald), we unfortunately know little of the chemical substances furnished by the blood glands which have come into consideration—little concerning the chemical materials supplied in the internal secretions. From the occurrence of many characteristic influences of stormy and sudden events in our emotional world, or appetites, it is easy to infer a fermentative mode of functioning on the side of the emotions.

From the other materials produced in the blood through metabolism or supplies to the blood, one might take into consideration cholin, lecithin, calcium compounds, etc., materials which play a not small rôle according to experience (H. Mayer) in the demands and activities of the autonomic system.

According to this viewpoint, one would consider also, of course, the regulating or adjusting function of the sympathetic nervous system, which controls especially the innervation of the adrenals, and which receives in turn stimuli proceeding from the chromaffine system. Moreover, one should not forget the immense rôle which devolves upon mnemonic stimuli, that is, those sorts of stimuli inaugurated through impressions stored up (personal experience), and carried over to the present.

The ideas just now developed lead us further to the question concerning the more precise distribution of the sorts of stimuli in the central nervous system serving as a basis for emotions of the moment, and becoming effective in this manner. How does the election of definite forms of stimulation occur here; how does it arise out of the manifold stimuli-collisions in the central nervous system? As with "sensation" and stimulus is there an alliance and conduction-insuring result, on the one hand, and on the other inhibition and breaking of contact for those stimuli hindering success, in the sense of a certain reciprocity, which plays an important rôle? Is it not conceivable that under definite conditions, there might be hypersecretion or hyposecretion of certain materials furnished by the endocrine glands, for instance, of adrenalin, and that they might influence true points of attack for the decision of stimuli-collision, in a definite sense, or for the victorious emergence of a well-defined emotion of such import as decides the issue? One could represent to himself that even in the sphere of "emotional choice," the reciprocal inhibitions could be brought into play on the scene, that—prob-

ably also without alteration in the composition of the inner secretions—the emergence of a very definite emotion would be determined through self-enforced restraint of the sorts of emotions opposing the success of this stimulus; the depression would “deadens” the temporary feelings of pleasure and expansion, or repress this last to a considerable extent, or vice versa. We might further take into account as important for the denouement of the emotional collision in the positive or negative sense, the family heredity, education, imitation, habit, immediate individual interests, capacity for rational thinking, etc.

What rôle does the flooding of the blood with adrenalin play with reference to strong emotion, that is, in liberating passion? Such an inundation is an experimentally demonstrated fact (Cannon, Asher, etc.). Is it a question here of furnishing means of defense against other still unknown substances of the inner secretions, or of a stimulus intended for the purpose of promoting the most important individual life interests against higher, ethical interests? Or to bring us in general onto a good condition for conflict and to kindle “life” within us? At the outbreak of the affect is only adrenalin secreted in abundance, or are there still other similar substances, of which the same can be said? Does not perhaps hypersecretion of a particular substance at the outbreak of a passionate emotion, in erotic feeling, for instance, correspond to a very different substance from that in anger, etc.? These and the questions raised above naturally create to-day still deeper, more obscure enigmas. In venturing towards their solution the aim is that we may be spurred on to thought, remembering always the many difficulties that intrude in this sphere, even in orienting ourselves, however roughly, in the biological sense.

In any case we do well in general in all hypothetical assumptions to take into consideration in an explanation not only the bio-physical but also the bio-chemical modes of functioning just mentioned.

In respect to what now concerns the anatomical point of attack for the numerous forms of emotion corresponding to more delicate processes in the central nervous system, we must remember in this connection that the affinity of the various sorts of nerve cells for the different bodies floating in the blood, varies greatly, and that the autonomic system is excited or paralyzed through different chemical bodies from the sympathetic, and, further, that the centers in the oblongata certainly react to toxins in other ways than in the cortical cellular system. In the distribution of stimuli in the sphere of the emotional world, a prominent rôle very certainly is played, moreover

to emphasize it once more, by not only the chemical combinations that have accumulated in the blood (ferments?), but also above all by the very different temporal (also historical in the evolutionary sense) constructions of latent forms of stimulation in the cortex; that is, by the periods of acquisition of certain forms of emotion (for instance, that of sexual emotion).

We see: valuable and new as is the viewpoint which bio-chemistry can supply in the study of the problems of emotion, yet the bio-chemical aspect is much too one-sided and indeed too barren to serve alone as a basis for the conflict for precedence of the various psychic emotions. In my opinion the greatest significance and fruitfulness in the study of the emotions must always be ascribed to the biologicico-psychological viewpoint, which to be sure must keep pace with the results of bio-chemical and bio-physical inquiry. In the "psychic" emotions and altogether in morality, it is a question, as is generally known not only of phenomena taking place in the immediate present (in which bio-chemical processes play an exceedingly prominent rôle), but also of the total of experiences built up and evaluated according to the individual and social life interests (the individual mneme, then the endless series of experiences more or less emotionally colored, that is, engrammes). Experience, habits of life, and the differentiation of the emotions closely linked with them, have created by degrees strong emotional values in the various kinds of animals, and the individual experiences have elaborated them still more richly, all on the basis of the most important life interests. It will be of importance consequently to study in greater detail first the development of the emotions in the child with regard, at the same time, for the evolution of the finer tectonic structure of the central nervous system.

The point of view excellently adapted for understanding the pathological psychic factors of the emotions and of the physiological processes closely interlocking with these, is that which (while making far-reaching allowance for phylogenetic evolution) proceeds from the continuing growth of the emotions in the child, and follows up their successive stages of development and structure. The emotions ("somatic emotions" and basic instincts) depict the strictly primary elements; they create and control the wider "answers" of the nervous substance, and in this way lay the basis for gnosis and causality. Emotions without attendant "ideas," that is, emotions equipped with only a rudimentary basis, that is, fragments of orientation in space (first at the mother's breast) and with the most elementary gestures, we observe only in the new-born. Already they

give evidence there of an unmistakable division into impulses and wishes, into movements which indicate pleasure or displeasure, or pain, and into emotions of "discharge" (satisfaction and rest). On the way to the realization of the wish, in the emotional transition from tension to release, we encounter in the child expressions of displeasure, pain, impetuous will, even to passion or pleasure, comfort, satisfaction, according as this process produces an unpleasant disturbance and interruption of a satisfactory outcome. The infant appeasing his hunger at the mother's breast seems to luxuriate in immediate satisfaction, and it is easy to understand how certain authors have designated this emotional phase as "auto-eroticism" (Freud). But the gratification in the reception of food has only a single quality in common with sexuality, namely, satisfaction (relaxation of tension).

The morphological expression of the successive becoming of the emotions and appetites, with all the attendant phenomena in the realm of sensation and excitation, is furnished by the increase and the systematic development of the nervous elements and connections, later also by myelinization. This impulse towards growth and differentiation one can represent theoretically as a process running parallel to the continued impulses in the building up of nervous performances, in such a way that an "original emotional impression" corresponds to a minimal morphological factor. Of course one will be able to demonstrate objectively this minimal developmental change enacted in the space of a second, neither microscopically nor chemically. If for no other reason than for the reason that often indeed the same nervous elements will be made use of in very different stimulus combinations.

In the new-born child there are, to begin with, as stated, only "original emotions"; somatic emotions, pain and pleasure, etc., and at best very weak original sensations. The mnemonic emotions and sensations arise at first gradually a few weeks after birth. The first germ of orientation in space, with which "engraphie" and thereby causality also (first coördination of motive and execution) are set in play, and makes its appearance after the first month, and by about the third month orientation in space and coördination in the child's own body is reached, simultaneously with the first reflex motions involving orientation and with completely functioning vision. From this time forward, every vigorous drive founded on the narrow interest sphere of the infant is accompanied by an appropriate flaring up of the psychic emotions as soon as he becomes aware of memory pictures of known emotional tone; processes which exercise and

perfect themselves daily in related impressions, and increase in strength and significance.

Every newly awakened emotion connects itself to previous ones liberated in similar situations. Thus there are "emotional products," "reproductions," "double reproductions," etc. These are compared with earlier ones of different sort and are distinguished in a vague way: the ones are preferred, the others refused, that is, are evaluated in accordance with some necessity. Thus it happens that towards the end of the first year there is already a well differentiated scale of emotional drives. Now the child comes into a new period, where every vigorous impulse awakens not only adequate images, but especially discounts future values, and where according to the nature of the impulse, expectation, hope, fear, disappointment, are added to the emotion of the immediate present, and fuse with it. Moreover a positive emotion automatically stamps out and suppresses the negative, in a vigorous release of the emotions, and vice versa.

The more the world of experience increases so much the richer and more differentiated becomes the emotional register. There are now strong latent values (not only love, hate, joy, anger, but also transitional and intermediate steps of such emotions, as for instance, surprise, humor, teasing, playing, confidence, etc., later also, right and wrong).

The first steps in a differentiation of the emotions originate in individual experiences and in the psychic working over or elaboration of these, and have as their basis: above all the most important life interests (or emotional values) of the individual (self-preservation), then of the species (preservation of the race), then of the tribe and group, and finally the prosperity of the whole world (even from the more lofty viewpoint, beyond the individual), that is, universal perfection. This differentiation is won in the continued conflict of the various instincts and emotional values for precedence among themselves, whereby now the interests of the individual in the immediate present, now such in the future, now more the personal, now more the unaccustomed and strange, bear away the victory. The umpire represents reason, that is just beginning to show itself. We find traces of this conflict, though not always perceptible from without, *i.e.*, in a latent form, already in the child, at any rate already in the pre-school age.

In the building up of the emotions and the emotional values in the child, we can discriminate the following periods which overlap one another:

1. Period of the purely instinctive life, when in the psychic dawn of life (of the first three months) the interest of nutrition and of bodily comfort exercise exclusive authority.

2. Period of the first discovery of orientation and of the child's own body. Coördinating activity of the senses and construction of the world of sensation. Now begin the primitive modes of expression, with positive or with a negative stamp (true laughter, true weeping, that is, not merely crying aloud).

3. Period. Awakening of joy and love, of fear and anger, of inhibition (yes and no!), etc. First use a definite feeling register (six to twelve months).

4. Period of the symbol, especially of the symbol of speech. Beginning of the desire for affection and praise. Strengthening of the feeling for the prohibited, feeling of guilt and punishment; on the other hand, the feeling for affinity, of thanks, etc. (until the third year).

5. School period. Development of strong moral values, understanding of industry, appreciation for the noble, judgment of naughtiness and of ostracism, desire for having extraordinary accomplishments, strengthening of the foundation of personality. Symbol in games and competition with comrades, awakening of ambition.

6. Puberty. Awakening of sexuality, that is, lively curiosity about sexual questions. First sexual currents and eddies (at times of a perverse nature, perhaps with a deep "tragic" character). Stronger emphasis of the personal future and impulse towards more definite, more distant goals. Longing, hope, striving for reward. Eager cultivation of companionship, beginning of consideration for the interests of others, gradual formation of the conception of honor, development of the sense of justice, of social obligations, etc. (about thirteen to eighteen years).

7. Period of preparation for career, and the first activities toward it. Stronger aims and plans; stronger striving towards power and results; rivalry, a more vigorous and profound ambition. Releasing of energy, vigorous awakening of interests in higher, more spiritual problems (religion, art, philosophy). More intense desire for voluptuousness (excesses), sexual passion. First striving for feminine favor, search for a life-partner, pressure towards a well-ordered sexual life, with undertaking of responsibility for consequences (about nineteen to twenty-five years).

8. Greater stability. Energetic pursuit of career, and continual striving towards the fruits of labor, especially towards possession and influence. Founding and care of the family, careful selec-

tion of associates, industrious carrying out of social obligations. Period of spontaneous fulfilling of obligations, goals and understandings with wider outlooks. New conflicts in the individual, family, and above all, in national (political) interests (about twenty-six to forty years).

9. Period of clarification and ripening. Family and home constitute the focus. Crystallization of character. Growing significance of life, observation, and energy. The future and the harvesting of the fruits of achievements, the security of life and family and especially posterity receive increased attention (forty-one to sixty years).

10. Period of regained ethical equilibrium. Retreat of passion. Relaxing the struggle for achievement, greater objectivity. A more intense need for inner composure and more frequent glances into the past. Striving for inner harmony and adjustment, for justice, etc. Return to intellectual pleasures, increased care for the future, especially for the family, race, and nation. Striving to build up and insure his life-work. Stronger prominence given to humanitarian emotions. Excessive saving even to avarice. Gradual lessening of interests in new impressions and changes (sixty years to extreme old age).

If we sum up the outstanding grouping of the developmental phases of the emotions just detailed (of course roughly and with allowance for variations), we see that already in relatively early childhood (before the school age), besides the transitory but powerful early instincts, (for preservation, food-getting, acquisition), primitive and embryonic ethical conceptions of permanent moral value are differentiated, (above all in the aspect of what is good and what is bad; what is allowed and what is not allowed, etc.) All these values advance the organization of that which is personally experienced, that is, the capacity to distinguish objects and situations; in other words, the first perceptions of things. An especially powerful rôle in this continued multiplication of individual experiences (at the time when speech is being learned), is played by the tendency toward the perceived image with a somewhat vague, usually exaggerated feeling tone (emotion) and a typical emotional character issuing from this (causality in disguise): curiosity and questioning. Of course, at this stage of development where the "gnosis" and the "practice" and the symbol for the first time take root deeply, one can not yet speak of a sharply defined morality. However, one must notice that the impulses to development are very noteworthy in this direction and are characterized by precursors and advance signs (in the sense of a tendency to self-preservation). Always how-

ever, crude self-preservation (also protection and preservation of the separate organs of the body) and the wishes directed towards this, the blind impulses command the field.

The sexual world, that is, the impulse towards preservation of the race (even to care of, and anxiety for, posterity), germinates usually in saltatory manner, sometimes before expected periods of development, with some degree of activity (blind interest in the other sex, erection, and masturbatory manipulation), but such appearances are sporadic and usually only temporary. Nevertheless it is certain that the sexual feeling which later plays so important a part, can be released long before the real puberty and in manifold form, and that in the building up of morality—before detailed experiences in this field are assembled—it plays a latent rôle (shame and shamelessness). Nevertheless we shall not here enter into detail.

How does the morphological basis for the development of the emotional world that has just been sketched in brief, behave? Does this factor find expression through ripening of the elements, through new tectonic differentiation, perhaps even through myelinization? Perhaps all this has something to do with it, but we have little detailed confirmation of the fact. The maturity (differentiation of the nerve fibers and the ganglion cells, and formation of the medullary sheath) begins in the vicinity of the end-organs (ganglia) and also in the spinal part of the embryonic medullary tube, relatively early, that is, already in the third and fourth fetal month, and the whole metameric system, with reference to the myelinization in motor and sensory nuclei, does not tarry far behind, excepting in the cerebellum, the midbrain, and especially the cortex. In the myelinization phases of the nursing period neither in the brain stem nor in the neencephalon can anything certain be recognized with reference to the building or differentiation of the elements, which can serve the instincts of an anatomical basis. Myelinization in general even in the cerebrum takes place through very distinct bounds which upon a closer observation seem to flow one into another, and these doubtless disclose a certain parallelism at least with the development of the world of sensation. The building up of the emotions goes hand in hand with the building up of the sensations. One must in the meantime bear in mind with reference to the former that they really represent the product of a continued reciprocal activity between the visceral organs especially the endocrine glands and the visceral ganglia and the central nervous system, and that this activity does not necessarily come to expression morphologically in a definitely demonstrable way. The richest performances in the field of emotion take place, if one may localize them

at all, where the world of sensory sensations have their central representation, namely in the cortex, in the superior granular cell layers, where the small, histologically badly differentiated elements (polymorphous strata: small nerve cells with richly branching axones) lie close together, embedded in a rich fibrillary substance, and defying every morphologico-tectonic organization. This layer develops very late: the tangential fibers (inclusive of the Kaes-Bechterew layer and supraradial "wicker-work") receive their myelin first in the school age and sometimes later!

One can represent to himself the further development of the brain (from the beginning of myelinization on) together with the finer construction of the psychic performances, as a continuation of the histo-tectonic development in the sense of a finer, morphological completion of those paths of innervation upon which the strongest claims are made in life, either in daily use or in education. The forms of excitation most frequently and energetically entering into activity are, other things being equal, the most resistant just as are the structures (morphological) serving them as a basis, granted that we presuppose a participation of the glandular secretions. The individual innervation impulses (inclusive of ecphoric performances) can naturally be constructed only theoretically—as incalculable impressions following one another. The pathways established and inhibitions which occur in this process must also be looked at from this viewpoint, and will receive their firmer foundation later when the pathological nervous phenomena are discussed.

Certain it is at any rate that the primary instincts as the oldest phenomena in the sphere of the emotional life, and also in the adult life, are most capable of resisting all life insults (at least up to a certain age), and that the altruistic emotions grafted upon the primal instincts (social feelings and world feelings), can only flourish and come to perfection if the somatic, that is, physiological and biological conditions are rightly fulfilled (exercise and education). It is well known that it is easy to shatter these new structures by influences threatening the vital interests (outbreaks of passion); but it is not easy to destroy them and then the game belongs entirely to the primal instincts.

The heavy inner conflicts and other soul insults, even unfulfilled wishes and inhibited instructive impulses, prejudice, we know, the perfect functioning of the sympathetic and the visceral nervous systems, and therewith too, the secretions of the endocrine glands. But more of this at another time.

(To be continued)

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Blum, Aubel and Hausknecht. DIURETIC ACTION OF CALCIUM. [Bull. d. I. Soc. Méd. des Hôp., November 25, 1921, XLV, No. 34. J. A. M. A.]

Blum, Aubel and Hausknecht have previously explained the diuretic action of potassium salts as owing to the potassium displacing the sodium in the tissues. The sodium is then cast off, and with it the water that has been retained to balance the sodium. They here report research on calcium salts which shows they are equally effectual in inducing diuresis, and by the same mechanism. The antagonism between calcium and sodium is even more pronounced than with potassium. In one case reported, the diffuse edema had persisted unmodified by the usual diuretics, but the weight dropped rapidly by 11 kg. when calcium salts—especially the chlorid—were administered. As soon as the calcium was suspended, the decline in weight stopped. When the woman of fifty-eight was given a mixture of sodium chlorid and calcium chlorid, she increased in weight, and there was no diuretic action, merely three diarrhetic stools. The ascites with cirrhosis of the liver subsided likewise under calcium chlorid in three cases described. The effect is at least as pronounced as with potassium salts. The intake of salt has to be restricted, and the dose of the calcium chlorid has to be adequate. Their usual dose was 11.1 gm. of the calcium chlorid by the mouth, but they gave up to 22 gm. in some cases. They suspend the drug after five or six days, and wait for eight or ten before resuming it. They explain that the calcium seems to be eliminated by way of the bowel; the chlorin by way of the kidneys. As the chlorin is freed from the calcium, it is forced to combine with sodium, and the sodium is cast off, and with it the surplus of water.

Kylin. HYPERTONUS AND RENAL DISEASE. [Zentralbl. f. inn. Med., June 4, 1921.]

This clinical study is a useful corrective to one-sided interpretations of cardiorenal vascular syndromes. The old view that persistent rise of blood pressure is always caused by renal disease is not supported by recent research. Von Monakow has shown that there are cases of hypertonus in which the kidneys are not affected in spite of arteriosclerotic changes in other regions, and on the other hand considerable changes may be found in the renal vessels without hypertonus. The primary charac-

teristic of hypertonus is therefore a rise of arterial pressure. Whether this is due to somatic or psychogenic factors cannot be determined at present. Von Monakow maintains that there is much in favor of the rise of pressure being due to vascular spasm. He describes cases in which the rise of blood pressure had lasted for a long time, and subsequently no hypertonus was found in spite of repeated examination. In order to determine to what degree the arterial blood pressure may vary under the same circumstances at different times of the day and on different days, Kylin examined the blood pressure of a number of patients every morning and evening. During the whole period of examination, which usually lasted eight to ten days, the patients were confined to bed. The blood pressure was examined between 9 and 10 A.M., and again between 5 and 6 P.M. daily. The patients were arranged in three groups: (1) so-called mild nephrosclerosis, (2) so-called diffuse acute glomerulonephritis, (3) other diseases, such as sciatica, neurasthenia, and gastric disorders. In this group, in which there was no rise of blood pressure, the variations in the readings were very slight and did not exceed 10-15 mm. Hg. In the first group the variations were greater, in one case being 75 mm. Hg in the course of twelve hours. As a rule the readings were lower in the morning than in the afternoon. Kylin regards the great extent of these variations as an indication that the cause was a psychogenic vasoconstriction. In diffuse acute glomerulonephritis, which usually occurs after an infectious disease such as scarlet fever, tonsillitis, infection of the upper respiratory tract, etc., there is a sudden rise of blood pressure accompanied by the appearance of albumin, casts and red corpuscles in the urine, and in a large number of cases by edema. In a number of cases of scarlet fever and tonsillitis Kylin found that a rise of blood pressure often occurred before the appearance of albumin, casts and red cells in the urine. Lindberg, of the Stockholm Fever Hospital, also noted that the blood pressure in scarlet fever patients began to rise about a week before the appearance of nephritis and that the rise of blood pressure was accompanied by an increase of weight which indicated commencing edema. It therefore appears certain that peripheral symptoms such as rise of blood pressure and edema may occur earlier than the true renal symptoms such as albuminuria, casts, and red corpuscles in the urine. In none of the cases of renal disease accompanied by hypertonus was there any evidence that the primary morbid process was situated in the kidneys. On the contrary the renal disease appeared to be a consequence of the vascular lesion.

Rémond and Menvielle. ORGANOTHERAPY IN UREMIA. [Bulletin de l'Académie de Med., Paris, February 15, 1921.]

Parathyroid extract therapy here is reported upon as having modified the Ambard coefficient in seven cases of uremia. From the average of 0.44 before treatment it changed to an average of 0.085. The opposite effect, the coefficient from about 0.074 before, becoming 0.12 or 0.289

afterward was brought about by thyroid therapy. Under parathyroid treatment the urea in the blood dropped from 1.9 to 0.94 gm. (ten injections of the extract on alternate days with two cachets daily). In six cases the residual nitrogen in the blood that had averaged 0.20 before the parathyroid treatment, averaged only 0.074 afterward. The authors conclude that parathyroid therapy is useful in combating uremia.

Brieger and Rawack. PITUITARY EXTRACT FOR FUNCTIONAL KIDNEY TESTS. [Med. Klin., December 4, 1921, XVII, No. 49. J. A. M. A.]

Brieger and Rawack confirmed in tests on healthy subjects that pituitary extract first checks diuresis and then exaggerates it, accompanied by augmented elimination of sodium chlorid. The pituitary extract was injected by the vein after the subject had drunk a liter of water. They give typical charts from five cases of kidney disease, showing the modification in the curve in pathologic conditions. The difference between the phases is much less distinct, and the response is more protracted. They warn against the test in cases of high blood pressure, stating that, even in the healthy, nausea, headache or irregular pulse were sometimes observed.

Epstein, A. E. NATURE AND TREATMENT OF CHRONIC NEPHROSIS. [Am. Journ. of Med. Sciences, February 1922, CLXIII, No. 2. J. A. M. A.]

In conformity with the hypothesis that chronic nephrosis is a metabolic disease related to a state of hypothyroidism, Epstein has used thyroid gland therapy in a number of cases resistant to usual treatment and with gratifying results. The effect of thyroid feeding in some cases of nephrosis was so striking that Epstein is convinced as to the relation of thyroid deficiency to this disease. The frequent occurrence of nephrosis in children and the usual gravity of the condition in such cases suggest the possibility of its being due to a deficiency of some factor in the food—possibly a vitamin. The diet proposed by Epstein consists in the feeding of a high protein, fat free, carbohydrate poor diet. The protein is to replace the protein lost by way of the urine so as to increase the osmotic force of the blood. The fat free carbohydrate-poor part of the diet is to compel the body to utilize the protein as well as the lipoids which are present in the blood stream.

2. ENDOCRINOPATHIES.

Meyer. INTERSTITIAL GLANDS IN THE OVARY. [Zentralbl. f. Gynäk., April 30, 1921.]

The author here criticizes the theories and even the therapeutic methods which have been based on the supposed existence of interstitial and puberty glands. Histological examination of ovaries taken from female subjects of all ages, shows that interstitial glands in the human species are not present. Misinterpretation of sections made tangentially

through the theca follicularis or to misconstruction of lipid remnants of dead cells derived from follicles or corpora lutea are the faulty details. The term "puberty glands" is incorrect; at the time of puberty there is no increase of theca cells, much less are interstitial glands visible. The secondary female characteristics, mental and physical, may develop in the absence of ovaries, and in some cases are not hindered by the presence in the body of numerous testicular interstitial cells; it is incorrect therefore to ascribe sexual specificity to interstitial cells or "glands." The true function of the theca cells is unknown, but they may be concerned with the store of nutrition for the ovum or corpus luteum; the theca cells of retrogressing follicles have disappeared by the end of pregnancy or the beginning of the puerperium.

Royston, G. D. OVARIAN SUBSTANCE. [Mo. State Medical Journal, XVIII, No. 2.]

The author warns against expecting 100 per cent cures of vague and more or less undiagnosed conditions by the administration of ductless gland extracts. The accurate diagnosis of endocrine disorders is difficult, on account of the lack of perfect knowledge of all of the secretions, but is essential if results are to be obtained. The rôle played by nephritis, syphilis, tuberculosis, tumors, and inflammatory conditions must be given consideration in both organic and functional disorders of the ductless glands. Thirty-one (31) case reports are submitted in which the parenteral administration of a soluble extract of the whole ovary called "ovarian substance" was used. The cases were selected with the idea to avoid the indiscriminate use of the substance.

Artificial Menopause: Eight cases, six of which were practically cured and in the remaining two cases, results could hardly be expected on account of the many complications; both having syphilis, one a constitutional psychopathic inferiority, the other had suppurative sinusitis, otitis media, errors of refraction and constipation. One additional case of profuse and irregular menses every 15 to 30 days, duration of six to seven days, following removal of both tubes and one ovary, the remaining ovary being about the size of a hen's egg. Normal menstrual cycle returned and hysteria disappeared after eight doses of ovarian substance, 2 c.c. each given weekly.

Menopause (Natural): Two cases. One complicated with retroversion, chronic subinvolution and relaxed pelvic floor. Hot flushes disappeared after the third injection and the pelvic pain, leucorrhoeas, etc., left after hysterectomy and perineorrhaphy. The other patient who complained of hot flushes, nervousness and headaches, reported herself well after 7 injections of 1 c.c. each, subcutaneously once a week.

Amenorrhea (Periodic): Two cases. One showed response in a prompt menstrual for three successive months, after which the amenorrhea persisted despite treatment. The other patient who complained

of infrequent menses and hysteria, was discharged after 16 injections, feeling perfectly well and with practically normal menses.

Tardy Development of Genitalia: One case, married 12 years, never pregnant. Uterus infantile in type. Complaints of hot flushes, headaches and scanty menses. After 10 injections of 1 c.c. each, given twice a week, all symptoms except scanty menses disappeared.

Nausea and Vomiting of Pregnancy: 17 cases. 15 markedly improved, one doubtful and one not improved. In 11, there was complete relief after the sixth injection. Injections of 1 to 2 c.c. were given once or twice a week, depending upon the severity of symptoms.

Conclusions: Ovarian substance, given subcutaneously or intramuscularly, is an agent of the greatest value in relieving symptoms caused by a deficient secretion, particularly those cases of menopause with an irritable sympathetic nervous system.

It has no advantage over corpus luteum in nausea and vomiting of pregnancy. The results obtained will depend upon an accurate diagnosis and a proper selection of the conditions treated. [Author's abstract.]

Marie and Fourcade. OPOTHERAPY AND THE MENOPAUSE. [Bull. Soc. de Thér., March 9, 1921.]

The menopause in neuropathic subjects as well as in women with renal or hepatic insufficiency is recognized to be a time of great importance to the psychical life of the woman. Phobias, obsessions, depressions, acute confusions and more or less systematized persecutory delusional thinking are frequently observed in the period preceding, accompanying, and following the menopause. The suppression of the menstrual flow is not responsible for these symptoms according to the argument here put forward. The chief part is due to a deficiency of the endocrine glands, especially of the thyro-ovarian secretion. They have therefore made a systematic use of opotherapy in all the mental disorders of the menopause. After a preliminary period devoted to a disintoxication of the system, when, as is the rule, a slight hepato-renal insufficiency exists, opotherapy is instituted, consisting in all cases of thyroid and ovarian extract and supplemented by suprarenal extract or extracts of other endocrine glands in the presence of symptoms indicating their insufficiency. The histories of eight cases are recorded, in six of which considerable improvement occurred, and in two no result was obtained from this treatment. Not necessarily showing the incorrectness of the hypothesis but rather its incompleteness. Something lies back of the changes in the glands which in some is counteracted by opotherapy, in others not.

Baldwin, J. F. LATERAL PARTIAL GLANDULAR HERMAPHRODITISM. [American Journal of Obstetrics and Gynecology, December 1921.]

Two cases are reported: The first, an unmarried woman aged thirty. Had never menstruated. No apparent vagina; greatly hypertrophied

clitoris; coarse voice, much hair over face and body; habits and inclinations strictly feminine; a history of menstrual molimen; pubic hair feminine in distribution; breasts well developed but rather small. Examination showed the vagina occluded by the perineum growing forward to the urethra; an infantile uterus. At operation the clitoris was amputated, the perineal obstruction removed, the abdomen opened, and a normal ovary and tube found on one side of the infantile uterus, and a globular mass, later found to be testicular, on the opposite side. The latter was removed, and the incision closed. Patient made a prompt recovery, married soon after, is perfectly well and happy in all her relationships, and has adopted a number of children. In the second case, a school girl of fifteen, had been a perfectly normal girl until a few months before, but had only menstruated twice, and the flow was very scanty. No preceding or subsequent molimen. Four months before, her voice became coarse with a growth of hair over the face and body; facial acne; marked change in disposition, was peevish and irritable, and wished to be alone; had gained rapidly in flesh. Examination showed a fleshy girl, with moderately developed breasts; voice like that of an adolescent boy; normal development of hair on genitals; external genitals normal, except a greatly enlarged clitoris; normal vagina, but entirely smooth. As she continued to get worse an operation was made later at which the clitoris was removed; the fallopian tubes were found normal, but the uterus infantile; the ovaries were represented by smooth masses about the size of the end of the little finger. Both of these masses were removed, and on section seemed testicular. Patient made an excellent operative recovery, but without any improvement in her condition. Continued to put on flesh until she weighed 250 pounds, and was perfectly helpless. Died of typhoid fever about a year later. No autopsy. [Author's abstract.]

Leighton. CLINICAL EXPERIENCE WITH CORPUS LUTEUM EXTRACT.
[Am. Jl. Obst. and Gyn., 1921, p. 613.]

The distressing symptoms of the menopause may be relieved quite frequently by the administration of corpus luteum extract. Luteum extract supplies that element so necessary to the woman during her normal menstrual life, he maintains. This therapy exerts its greatest benefit in the treatment of those women who have begun to exhibit the early manifestations of the climacteric. To avoid the unsatisfactory results which have been reported by some gynecologists, it is necessary that luteum extract be administered early and continuously once the diagnosis is made. Procrastination on the part of either the patient or the physician often means ill success. When menstrual irregularity makes itself known and the hot flushes, mental confusion, tremor and hyperthyroideal symptoms are first evident, then is the proper time for ovarian organotherapy, not waiting until the height of the disorder has been reached or the woman has suffered for months or years with a

"chronic" menopause. Early control is necessary and, once obtained, it is of easy maintenance. In over half of the 300 or more women to whom Leighton has given luteum extract, the indication for its use was solely the menopausal syndrome. Of this number there were not over a dozen who could not report exceptional benefit, even to absolute relief. To those women who during the menstrual life complain of so-called "sick headaches" of the frontal and temporal type, with nausea and vomiting, which occur with peculiar periodicity, at or about the time of menstruation, ovarian organotherapy offers much relief. In chlorosis, as an adjunct to hematinics, luteum is also indicated. The functional amenorrhea of women, in early adolescence or mid-menstrual life, responds in a miraculous manner. In the use of thyroid as a "reduction cure" the giving of luteum at the same time seems to obviate the occurrence of profuse sweating spells, muscular weakness, tachycardia, nausea and other vasomotor symptoms, occasionally following the ingestion of thyroid extract. Larger doses of thyroid are tolerated, if given in combination with luteum. While Leighton has not had 100 per cent of success, it has been his fortunate experience to observe a relief and cessation of many disorders, referable to deficient ovarian secretion, where proper diagnosis is followed by the continuous, thorough and regular use of luteum extract. It is important above all, that one should prescribe and the patient obtain a product from recent fresh material and care must be taken to see to it that the dispensing chemist has such on hand. The indiscriminate buying of luteum extract is one thing which Leighton is careful to prevent. A patient is directed to the shop where he knows fresh tablets are to be had. Each prescription calling for such, bears on the direction label, "These must be taken for ten of twelve weeks," and special emphasis is laid upon this point. He explains every time, at the commencement of treatment, that it is cumulative in action, that it is nontoxic, when fresh, and that one must be conscientious in its taking, as results are obtained slowly and relief is not immediate.

Sabrazes and Duperie. THYROÖVARIAN INSUFFICIENCY, WITH HYPERTROPHY OF THYMUS AND HYDROCEPHALUS. [C. R. Soc. Biologie, May 14, 1921.]

A syndrome, which is not infrequently met with, of the thyroövarian insufficiency associated with hydrocephalus and hypertrophy of the thymus is here described by these observers. It was present in a woman who had suffered from a goiter, myxedema, hydrocephalus, ovarian insufficiency, since infancy. The thyroövarian insufficiency was combated by organotherapy but the woman died at the age of twenty-nine, during the course of an attack of typhoid. The autopsy showed a large goiter, a persistent thymus, hyperplasia of the pituitary, normal parathyroids, sclerosis of the choroid plexus, and a large hydrocephalus. Known as it is to occur in cretinism and rickets, hydrocephalus has not yet been recognized in association with pluriglandular lesions. Emphasis is laid

on the connection existing between the choroid plexus and the endocrine glands, and it is to this connection that the symptom of hydrocephalus is ascribed by these authors.

Lorand, A. STEINACH'S REJUVENATION OPERATION. [Siglo Medico. July 1921, LXVIII, No. 3528. J. A. M. A.]

Lorand asserts that the results of recent research have confirmed his theory announced in 1904 that senility is the result of primary degeneration of all the ductless glands, not merely of the genital glands alone. He says that he has been very successful in arresting the onroads of the signs of senility by a combination of thyroid and genital gland extract treatment, especially in women. Menstruation returned in many cases of amenorrhea under this treatment, after a hiatus of three to six months. He always examined the pulse and heart every four or five days, and has never had any mishaps in the sixteen years he has been applying it. Sun baths and the vaporized mercury light baths proved useful adjuvants, along with moderation in eating. After 50, the sensation of a full stomach should be avoided at all costs, especially if there is arteriosclerosis.

Crawford, A. C., and George, J. M. TESTES AND CERTAIN VASOMOTOR REACTIONS OF PENIS. [Journ. of Urology, February 1921, V, No. 2.]

This experimental piece of research seemed to demonstrate that there exists in the testes a substance which will cause a dilation of the spongy tissue of the penis. The volume of the penis is also increased by agents which dilate the vessels of the hind limbs in lower animals.

Desogus, V. THE BRAIN AND THE GENETIC FUNCTION. [Riforma Med., February 28, 1920, XXXVI, No. 9. J. A. M. A.]

Desogus compares with Ceni's experimental findings Forster's recent study of the ovaries in 100 insane women and Todde's study of the testicles in 200 insane men and in thirty others who had been killed accidentally or had died from acute diseases. All the data testify to a close connection between mental disease or trauma of the brain and the condition and functioning of the sexual organs. Mjöen's recent research on the relations between alcohol and generation has convinced him that the deleterious influence of alcohol on the organs of reproduction is not direct but through the superior nerve centers. Todde has emphasized the pronounced difference in the testicles of the insane and those of the noninsane dying from a similar cause, such as tuberculosis. Stieve reported in 1918 the extreme involution evident in the ovaries of hens kept in close captivity, in comparison to other hens. He ascribed this to the psychic influence of the confinement. None of the other internal organs showed appreciable change during the captivity. Ceni's conclusions from his more than thirteen years of experimental research and clinical observation are to the effect that the biologic processes which

constitute the phenomenon of procreation are under the control of nervous influences which are more and more complicated the higher in the animal scale. In the lower vertebrates the spinal cord alone is involved, while in the higher vertebrates the spinal cord controls merely the trophic processes and loses more and more of the control, which is assumed by certain brain centers. These brain centers function under the direct stimulus of psychic forces which, by their insufficiency or by their excess, may entail degeneration and hence sterility. An excess of psychic stimuli may excite or depress according to the individual reaction.

Laignel-Lavastine. BEARDED WOMEN. [Paris Médical, October 1921, XI, No. 44.]

In this clinical and critical review the author shows that hypertrichosis in women has both biologic and psychiatric importance. Amenorrhea is the rule in bearded women. The obligation to cut the hair every month in nunneries seems to have some connection with the gradual loss of menstruation in some of the nuns. Hair contains phosphorus, arsenic, and iodine. These chemical elements are also found in the menstrual blood. Hypertrichosis might be regarded as a compensating reaction in scanty menstruation. In addition to the genital, the fetal and the nervous types of hypertrichosis, the author discusses a syndrome characterized by adiposis with masculine aspect, hypertrichosis, and genital disturbances, amenorrhea and virilism. In a similar case described by Maclaure, the hypertrichosis disappeared after suprarenallectomy from tumor. In five cases observed by Laignel-Lavastine, the hypertrichosis accompanied various psychopathies, and he emphasizes the distinction between hypertrichosis with tendency to glycosuria and hypertrichosis with tendency to periodic psychoses. His endocrine tests on this group of five bearded women lead him to an interesting dynamic compensatory interpretation, namely the presence of the hair is a biological protection against a psychosis. [This point of view, in general is well known to American psychiatrists who have followed the work of Adler, Bertschinger, Jelliffe, White and others.]

Haudek and Kriser. X-RAY TREATMENT IN EXOPHTHALMIC GOITER. [Klinische Wochenschrift, February 4, 1922.]

The results of X-ray treatment in exophthalmic goiter is here presented and discussed on a literary basis on their own experience in 38 cases, of which 12 only were followed later. Four of these 12 were cured, seven much improved, one slightly improved. The results of various observers are given, and the authors consider that the good effects of the treatment can no longer be questioned. The nervous symptoms are beneficially influenced first and most markedly. The tachycardia diminishes rapidly and the weight increases. The recovery as regards the goiter and exophthalmos occurs relatively slowly; it is often incomplete, and does not occur in all cases. The results are best in

young patients and in cases of short duration, but in chronic cases very considerable improvement may be obtained not infrequently. Statistics from literature show that the percentages of unsatisfactory results in operative and in X-ray treatment are similar; but as regards mortality after treatment, the statistics are definitely in favor of X-ray treatment, since death from X-ray treatment does not occur, or at least is quite exceptional. Adhesions of the thyroid capsule are no longer feared; they are neither constant nor important. The risk of producing increased thyroid activity or of myxoedema is avoidable by caution as to the intensity and mode of application.

Eddy, U. B. INTERNAL SECRETION OF SPLEEN. [Endocrinology, July 1921, V, No. 4. J. A. M. A.]

The hypothesis that the spleen produces an internal secretion, Eddy asserts, is supported by (1) the changes in the erythrocytes after splenectomy, (2) the modification of the blood picture in hyperplasia of the spleen, ameliorated in some cases at least by splenectomy, and (3) the specific effects on the red blood corpuscles of injection of splenic extract. He suggests that the chief function of the spleen is the removal from the circulation of the disintegrated erythrocytes; that the splenic cells elaborate this material producing thereby an internal secretion, which was a component of the erythrocyte, either stroma or pigment portion; that this internal secretion reduces the resistance of all the red blood corpuscles, the effect amounting to actual destruction of the older cells; and, finally, that this internal secretion, possibly after modification by the liver, stimulates the erythrocytic function of the bone marrow and is used up in the manufacture of new corpuscles.

Editorial comment. THE SIGNIFICANCE OF A PERSISTENT THYMUS. [J. A. M. A.]

The association of sudden death with enlargement of the thymus was noted by Bichat early in the eighteenth century; Paltauf and others of the Vienna school showed that the persistence of the thymus in these circumstances is only one of a combination of hereditary anatomic imperfections occurring in the same body, and Charles Norris pointed out the external manifestations by which the condition of status thymicolymphaticus can be detected clinically.¹ Since then the recognition of this condition, especially on the necropsy table, has become general, and its medicolegal importance is universally accepted. The chief characteristics of status lymphaticus are not limited to the general hyperplasia of the lymphoid tissues, with enlargement of the thymus in the young subject or its persistence in adults, but there are also more general changes, including hypoplasia of the vascular system, delicate, clear, pale skin, noticeably rounded lines on a graceful body, scanty body and

¹ A review of this subject is given by Symmers, Douglas. *Am. J. Sc. CLVI*, 40 (July) 1918.

facial hairs, feminine distribution of the pubic hairs in male subjects, and other less significant changes. Symmers reports that per cent of the bodies examined at necropsy in Bellevue Hospital showed this condition to a recognizable degree.

Not only has the lymphatic constitution been found frequently in persons dying suddenly from trivial accidents, simple overexertion, or even mental shock, but attention has frequently been drawn to the presence of an enlarged or persistent thymus in persons who have committed suicide, and in criminals who have met death by violence. In the last groups of cases the persistent thymus has been interpreted as an evidence of constitutional defective development, of which the mental and emotional instability is merely a part.

During the war, however, the opportunity to examine large numbers of healthy, well developed men who have been suddenly killed has shown that the current view of the thymus as an organ which disappears soon after adolescence is not at all correct. Edgard Zunz² examined the thymus of a large number of Belgian soldiers who died soon after being wounded, and in forty-nine cases found in men between nineteen and thirty-four years but three with completely atrophied thymus. In the others the gland weighed from 6.9 to 31.2 gm. ($106\frac{1}{2}$ to $481\frac{1}{2}$ grains), averaging 15.7 gm. (242 grains). Yamanoi³ also found a persistent thymus in a large proportion of bodies of persons dying quickly of acute influenza. Sternberg⁴ calls attention to the prevalence of what seemed to be a lymphatic status in German soldiers killed during the war. He quotes Borst and Groll as finding in 2,000 necropsies a lymphoid hyperplasia in no less than 56 per cent, and in soldiers of from 19 to 20 years this condition was present in 86 per cent. The probable explanation of these findings is that the thymus does not undergo involution so rapidly as has been generally assumed, and that the abundant lymphoid tissue of youth persists well into adult life. So susceptible is the lymphatic tissue to toxic conditions or malnutrition that most persons who die otherwise than by a sudden death have suffered marked atrophy of the lymphoid elements, and our experience with necropsies on diseased bodies has given an erroneous impression of the age at which lymphoid involution takes place. In subjects meeting sudden death while in full health, the amount of lymphoid tissue found at necropsy is so much greater than that seen in the more familiar condition of death from disease that we are likely to consider that there is lymphoid hyperplasia, when actually the amount is normal. Presumably this accounts for at least some of the supposed frequency of status thymicus in suicides and in criminals meeting violent ends. It does not mean, however, that all our ideas concerning status lymphaticus are incorrect, for there is no doubt of the existence of the anatomic picture so carefully drawn by Paltauf

² Zunz, Edgard: Arch. internat. de physiol. üV, 569, 1920.

³ Yamanoi: Schweiz. med. Wchnschr. LI, 554, 1921.

⁴ Sternberg: Wien. klin. Wchnschr. XXXIV, 291, 19291.

and Norris. With this picture is associated a true hyperplasia of the thymus, for in Symmer's series of 118 cases of well developed status lymphaticus the glands usually weighed between 20 and 30 gm. (309 and 463 grains), as against the average weight of 15.7 gm. (242 grains) in Belgian soldiers. Nevertheless, these recent observations point out the necessity of discrimination in diagnosing status lymphaticus in persons meeting a sudden violent death, for the presence of a good sized thymus gland and well developed lymphatic tissues is not necessarily an abnormality in young adults.

Pribram, B. O. RESECTION OF THYMUS IN EXOPHTHALMIC GOITER. [Archiv. für klin. Chir., August 3, 1920.]

This is the report of a case of a woman of twenty-six in whom the thyroid was not much enlarged although the other symptoms of exophthalmic goiter were pronounced. The persisting thymus was resected in part along with portions of the right and left lobe of the thyroid. Striking improvement followed, the heart action becoming regular. Others have reported similar benefit from thymectomy in arrhythmia. Thymectomy is liable to modify certain properties which one regarded as constitutional. The favorable result of thymectomy in a youth of seventeen of eunuchoid type with pronounced status thymicus seems to support this view. The blood showed the lymphatic reaction and a brother had died from acute leukemia. Three months after the thymectomy, the epiphyseal cartilages had nearly completely consolidated, while the relative lymphocytosis had dropped to normal.

Pulawski, A. THYMUS DEATH. [Presse Médicale, May 1920.]

A clinical report in which a young man was found dead, face downward, in the bath tub. It was assumed he drowned during one of his epileptic fits. Autopsy, however, showed that the thymus was large for his age, and other findings completed the clinical picture of the thymic-lymphatic constitution.

Haberer. GOITER AND THYMUS. [Mittheil. a. d. Grenzgeb. d. Med. u. Chir., 1920, XXXII, No. 3. J. A. M. A.]

Haberer in his previous papers advocated a simultaneous operative reduction of the thymus in exophthalmic as well as in simple goiter when hyperplasia of thymus forms a complication. His studies now are extended by nine cases, and an analysis is made of the entire material, especially with reference to exophthalmic goiter, a total of 32 cases which recovered, and three which ended with death. Three cases were followed for seven years and showed thus far perfect recovery from all symptoms. Other three cases were observed for six years; seven for five; three for four; eight for three, and eight for two years or less. In some instances nervous symptoms were noted, probably superinduced by the war. In 10 cases where an operative reduction of thyroid and

thymus had taken place, there was a recurrence of the goiter, but wholly without exophthalmic manifestations. The three cases which ended in death induce the author to warn against deferring the operation until irreparable heart disturbances have set in.

Settelen, M. E. CONGENITAL HYPERPLASIA OF THYMUS METAMERE. [Schweiz. med. Woch., September 1921, LI, No. 36. J. A. M. A.]

Settelen found in two cadavers of new-born infants two oval bodies on the back of the thyroid which resembled parathyroids. The microscope revealed that they were exceptionally large thymus metameres. They were the only cases of the kind ever found at Basel although special attention is paid there to the thyroid and thymus.

Ryser, H. EXPLANATION OF SUDDEN THYMIC DEATH. [Schweiz. med. Woch., June 1921, LI, No. 22.]

Four main theories have been advanced to account for sudden death in thymic states. Pressure from the enlarged organ; autointoxication; epinephrin deficiency and lymphocyte infiltration of the myocardium. The present paper accents the hypoplasia of the chromaffine system, plus the excessive thymus functioning, but with Celeen he regards the cardiac infiltrations as the most important factor. In some of the reported cases the muscle fibers had almost completely atrophied, with fatty degeneration. In Riesenfeld's cases the children with idiopathic cardiac hypertrophy died as soon as increased muscular action was needed. Sudden death is observed in persons who had recovered from the acute stages of influenza or other infectious disease, but there was an underlying degeneration of the heart which caused it to stop, just as in the cases of constitutional inferiority of the heart and vascular system in the status thymolymphaticus.

Yamanoi, S. THE PERSISTING THYMUS. [Schweiz. med. Woch., June 1921, LI, No. 22.]

The thymus in 303 persons over twenty-five who had succumbed to acute influenza, and in sixty older cadavers is here reported on by this investigator. Of 187 men in 26.34 per cent there was more or less persistence of the thymus, and in 116 women 20.68 per cent. This large total showing persisting thymus in persons between twenty-five and fifty leads the author to emphasize the fact that the persistence of the thymus is within physiologic range, and a large thymus tissue after twenty-five should not necessarily be regarded as a pathological affair.

Bircher, E. PATHOLOGY OF THE THYMUS GLAND. [Schweiz. Arch. f. Neur. u. Psych., Vol. VIII, 208.]

The writer has been able to observe the effect of thymodectomy upon ten children in whom tracheostenosis seemed to necessitate the removal of larger or smaller portions of the gland. Mental functions were

disturbed and the growth of the bone evidently interfered with. The appearance of the centers of ossification was delayed two and one-half to six years. Height was interfered with only in those children operated upon before the seventh year of age. These results correspond in general with those of the animal experiments of Matti except that in the children the diaphyses were relatively unaffected. No changes were found in the genitalia. Organotherapy proved of no avail. The writer concludes that thymus operations must be only most conservatively considered. Perhaps in tracheostenosis displacement of the gland must suffice.

Demel. HYPERTHYMIZATION. [Mitt. a. d. Grenz. d. Med. u. Chir., 1922, XXXIV, No. 4.]

An experimental animal research made upon rats by feeding with thymus. No apparent influence on the skeleton or organs of rats could be detected. Implantation of the thymus, however, from normal rats into others of the same litter was followed by more rapid growth of the bones in length and they matured earlier. The rats with grafted thymus were more active and were heavier. Neither the sexual glands, pituitary nor suprarenals seemed to be involved.

Carnot and Harvier. DIABETES AND SYPHILIS OF PANCREAS. [Paris Médical, May 15, 1920.]

This clinical paper summarizes some of the literature and also discusses four cases in which diabetes developed in syphilitics, but who showed only ordinary sclerosis of the pancreas on autopsy. One case, a woman of fifty-three years, had symptoms of diabetes and of neurosyphilis for two years. The pancreas was transformed into a sclerogummatous mass and this they think is the first case of the kind to be recorded.

Padilla and Paz. ETIOLOGY AND TREATMENT OF DIABETES. [Rev. d. l. Asoc. Méd. Argentina, July-September 1920, XXXIII, Nos. 189-191.]

This syndrome, the neurological aspects of which are coming more and more to the fore, offers much interesting speculative material for the neuroendocrinological fields. Three new cases are here reported and the outcome in three cases previously published, in all of which the diabetes had developed on a basis of a probably syphilitic impairment of the hormone producing part of the pancreas. As the sugar disappeared from the urine in all these six cases under specific therapy, this confirmed the syphilitic nature of the diabetes. Even in these syphilitic cases restricted carbohydrate intake is desirable to relieve the load put on the disordered pancreas.

Blau and Nicholson. FAT METABOLISM IN DIABETES MELLITUS. [Arch. of Int. Med., December 15, 1920, XXVI, No. 6. J. A. M. A.]

Twenty-six cases of diabetes were compared by Blau and Nicholson in relation of the blood fat to the blood sugar and were found to fall

roughly into three groups, the members of each group bearing certain clinical resemblances to each other. About 42 per cent of these cases showed, at the beginning of treatment, a marked increase of blood lipoids, along with a considerable drop of the blood sugar due to starvation or a severely restricted diet. This rise in the lipid curve must not be taken as a measure of the degree of impairment of the fat burning mechanism; it may be due to a normal response to fasting and also to an insufficient carbohydrate intake. Clinically these were all severe cases of diabetes. Blood fats seemed to rise and fall with the blood sugar in almost 27 per cent of the cases, decrease in the fat apparently progressing more slowly than the decrease in the blood sugar. All but two of these patients were in a milder stage of the disease. In about 31 per cent of the cases there was an almost constant value for blood lipoids, at high level, while the blood sugar decreased. They all presented a history of infection previous to the onset of diabetes, and suffered from a somewhat more severe form of the disease than those of the preceding group. The lipid value seemed to be lowest in a negative carbohydrate balance, showing that the diabetic organism can utilize fats more readily in the presence of large amounts of sugar in the body, and that in "sugar free" patients there must be a great strain on the fat burning mechanism when large amounts of fats are fed. Evidence of this may often be seen in the high values for plasma cholesterol.

Allen. EXPERIMENTAL STUDIES IN DIABETES, No. 5. [Am. Journ. of Phys., December 1, 1920, LIV, No. 2. J. A. M. A.]

The observations concerning infectious fever reported on here by Allen with the previous ones concerning the pyrexia of exercise in dogs, point to the fact that no specific aggravation of diabetes or lowering of tolerance results from the metabolic alteration attendant on elevation of body temperature in experimental animals.

Rathery, F., and Gruat, E. THE EXCRETION THRESHOLD FOR SUGAR IN BLOOD IN DIABETICS. [Encéphale, May 1, 1920, X, No. 18. J. A. M. A.]

By the excretion threshold Rathery and Gruat designate the level of the glucose content of the blood above which the surplus is thrown off by the kidneys. Sodium chlorid and glucose are typical threshold substances, in contrast to other substances, such as urea, uric acid, methylene blue, etc., which the blood tends to eliminate so long as there is any present. As the result of analysis of their own cases and study of the literature, Rathery and Gruat have reached several definite conclusions in regard to the excretion threshold for sugar in diabetes. A high glucose threshold does not necessarily signify a case refractory to dietetic treatment, nor does a moderately high threshold imply a mild diabetes.

Variability of the threshold is more significant than its mere increase. A high threshold, with great variability, points to easily controllable

diabetes, but if the threshold does not fluctuate much, then a high level is of grave import. A moderately high but nonfluctuating threshold is of doubtful prognosis. The relations between the rise of the threshold and the degree of glycosuria have likewise a prognostic and therapeutic value, as they explain in detail. When the glucose threshold and the degree of glycosuria vary in the same direction, the main thing to note is the degree of stability of the threshold. If the glucose threshold and the glycosuria vary inversely, either the threshold is high and the glycosuria is nil or very slight, or the threshold is low and the glycosuria is high. In the former case the prognosis is usually unfavorable. In the latter case the prognosis is somewhat more favorable, provided the threshold is slightly variable. The glucose threshold varies greatly in different diabetics. The excess of glucose in the blood above the glucose threshold will explain a certain number of glycosurias, but not quite all. The variations in the glycosuria are at times quite incommensurate with the modifications of the hyperglycemia. In any event, in different subjects there is a wide range of difference in the percentage of glucose excreted in the urine in the presence of a given hyperglycemia, for the reason that the kidney itself plays an important part in the modifications of the percentage of glucose excreted.

Lereboullet. DIABETES AND ACROMEGALY. [*Progres Médical*, March 1920, XXXV, No. 10.]

This discussion deals with some conclusions drawn from a case of acromegaly with attendant hyperglycemia and diabetes mellitus. Alimentary glycosuria or diabetes observed with acromegaly is due to nerve irritation at the floor of the third ventricle, he thinks; enlargement of the sella turcica is an accompanying phenomenon. Diabetes insipidus is due to the pituitary itself the author states but the glycosuria type is here thought to follow irritation in the vicinity of the pituitary, not in the latter itself.

Pittaluga, G. ACROMEGALY AND DIABETES INSIPIDUS. [*Siglo Méd.*, February 7, 1920.]

Acromegaly is frequently accompanied by polyuria which because it may be transient is frequently overlooked. As compression of the pituitary subsides or the parts adapt themselves to the compression, the symptoms may disappear.

Rohdenburg, G. L. THYROID DIABETES. [*Endocrinology*, 1920, IV, No. 63. *Med. Sc.*]

The author records observations on a group of four patients belonging to the same family: two sisters, the husband of one of the sisters, and one of the two sons of this couple. These four individuals developed diabetes, the two sisters at the time of the menopause, the husband at the age of fifty-six, the son at the time of puberty (eighteen years). In

the course of treatment various types of medication were applied; amongst other drugs, preparations of various endocrine organs were given. No appreciable effect was observed except when thyroid and adrenal were given. The administration of these glands greatly increased the glycosuria. The changes in the output of urinary sugar are described as "at times uncomfortably startling." The after-history of the cases is interesting. The three older patients died. The son developed exophthalmos and had a portion of his thyroid removed. Six months after the operation his urine was sugar-free and was still sugar-free four years later when he came again under the author's observation. Another case of a woman is reported in which there was first a development of Graves's disease which was treated by removal of one lobe of the thyroid gland. After a temporary improvement (gain in weight, slowing of pulse), she began to lose weight again and developed diabetes. This was followed by a great increase in the pulse-rate. Hyperthyroidism being diagnosed, the other lobe of the thyroid was extirpated under local anesthesia leaving the isthmus *in situ*. After a temporary increase in the urinary sugar, the urine became sugar-free four days after the operation and had remained so for three months, even after an unrestricted diet. The observations emphasize the importance of the thyroid gland as a factor in diabetes.

Terreros, C. S. de los. PANCREATIC INFANTILISM. [Siglo Médico, March 27, 1920.]

This condition, first emphasized by Bramwell, is here discussed. He has seen it in a number of children. The pancreatic insufficiency is not sufficient to bring about diabetes, but there are to be observed certain features of the metabolism which resemble those of diabetes in adults. He champions a hypothesis that the pancreas has three hormones, one serving for carbohydrates, one for the interglandular control of growth and development; the third forms the active element in the pancreatic juice. In children, insufficiency of the second and third hormones checks digestion and growth, while the carbohydrate metabolism may proceed with minor anomalies. Pancreatic insufficiency in the child causes weight loss; acetone and preacetonic bodies are present in the urine and the thyroid becomes overactive.

Hoshimoto, M. THE INFLUENCE OF THYROID FEEDING UPON THE PHYSIOLOGICAL ACTION OF THE PANCREAS. [Endocrinology, 1920, IV, No. 56. Med. Sc.]

Thyroid feeding in rats produces a diminution of the diastase in the pancreas. There is also, as has been noted before, a diminution of the acidophil granules in the cells of the pancreas and an enlargement of the whole gland. It is suggested that the steatorrhoea, which has been observed in several cases of Graves's disease, is the result of the action of the thyroid hormone on the pancreas.

Dubreuil and Anderodias. THE ISLANDS OF LANGERHANS IN DIABETES. [C. R. Soc. Biologie, November 27, 1920.]

This clinico-pathological case is adduced to offer some light on the part played by the islands of Langerhans in the polyetiological syndrome of diabetes. The patient, aged thirty-two, first gave birth to a very large stillborn child; albuminuria and eclamptic attacks had been present in the pregnancy. The second pregnancy was normal. In the third pregnancy, sugar appeared at the eighth month, 60 grams to the liter. A large fetus was expelled at term, much macerated, and the sugar disappeared. Up to the eighth month a fourth pregnancy was normal. The urine showed 50 grams of sugar to the liter. At the beginning of the ninth month induced labor and a very large fetus, which lived only for a few minutes, was removed. The amniotic fluid did not contain sugar, and it disappeared from the urine after seven days. Postmortem examination of the fetus revealed a liver more than three times the weight of the normal organ at that period. The other organs were large but apparently normal. Of the portions preserved for examination without any preconceived line of research, only the pancreas revealed histological abnormalities. Even with a low power the enormous size of the islands of Langerhans was a striking feature, though in the normal fetus it requires some search to find them. The islands appeared as very large compact epithelial cell masses, which by calculation were on the average twenty to thirty times the size of the normal islands. Whatever be the mechanism, the general function of the islands of Langerhans is to regulate the sugar content of the blood; they maintain at a fixed titer the normal glycemia. In this case the glycosuric mother supplied to the placenta blood highly charged with sugar; in all probability the fetal blood also obtained a superabundance of sugar. This excess of carbohydrate accounted for the excessive weight of the fetus, but it was necessary for the fetus to keep on destroying the excess of blood sugar, and such a function fell on the islands of Langerhans. Hence there was a hypertrophy of these structures and an outpouring of glycolytic ferment from them. The research, though very incomplete, as the authors admit, is suggestive.

Castellani and Willmore. GLYCOSURIA OF MALARIAL ORIGIN. [British Medical Journal, August 1921, II, No. 3164. J. A. M. A.]

A case of malarial glycosuria and one of malarial diabetes are recorded by Castellani and Willmore. In the first case quinin caused the disappearance of the glycosuria. At no time was the patient put on antidiabetic diet, and there was no restriction of his carbohydrate intake. There can be little doubt, therefore, that the disappearance of the sugar was due to the administration of quinin. The second case shows that there is a form of glycosuria of malarial origin, and that this condition may, at times, become so severe as to simulate true diabetes, the patient

losing flesh, becoming weak, complaining of thirst and hunger, and passing a large amount of saccharine urine. The glycosuria in this case was cured by the administration of quinin in full doses without any dietetic treatment.

Menninger, C. E. THE MODERN CONCEPTION OF DIABETES MELLITUS. [Kansas Medical Society, Wichita, April 26-28, 1921.]

The improvement that has been made in the treatment of diabetes mellitus in the past few years is greater than in any other acute or chronic disease. It has created a justifiable hopefulness for the curability of that disease. The passing of the cloud of pessimism of the curability of diabetes mellitus is due to five changes in the handling of the disease: (1) the extreme methods of treatment emphasized by Allen; (2) the more accurate tests for the estimation of the presence and severity of acid poisoning; (3) the abandoning of the routine use of alkalies; (4) through the early and repeated measurement of the amount of the excess of blood sugar; (5) and the conception of diabetes not merely as a glycosuria or an inability to assimilate glucose, but a disease in which there is an abnormality in the metabolism of the protein and fat as well.

The need of further improvement in the treatment of severe diabetes still exists. In order that this may be properly worked out it is necessary for us to have (1) a clearcut idea of the essential nature of the disease; (2) knowledge of how acid intoxication—the arch enemy of the diabetic—can be prevented, and (3) employment of all of the most refined and accurate laboratory tests of the diabetic's real status.

The essential nature of diabetes. Diabetes is a multiple metabolic disorder of which the failure to utilize sugar is merely one manifestation which only indirectly induces the fatal outcome. Diabetes appears at first as a weakened function of carbohydrate (sugar and starch) metabolism; next there is a weakened function of protein metabolism and then in the severe cases an imperfect metabolism of fat. Diabetes is merely the weakening of a bodily function, namely the function of assimilating certain foods. The author then emphasizes the necessity for a definite and ordinary procedure to be carried out in every case coming for treatment.

Summary of procedure in diabetes mellitus. First the *Data Period* in which a very complete history, physical examination, laboratory examinations of urine and blood are made which must be followed by the *Instruction Period* which is most important and covers a number of weeks. The patient takes a "course" in diabetic instruction, (1) on collecting of 24-hour urinary specimen, (2) in the three food constituents or normal diet, (3) what is essentially wrong with patient in his disease or diabetic diet, (4) of the nature of the treatment. No medicine, only diet; but absolute coöperation. (5) Of special hygiene for the diabetic. (6) Of the nature of the urinary tests for sugar and diacetic acid. Teaching the patient how to make these tests, and that it is altogether

up to him to get well, and being able to make these tests he can and must check himself, the physician merely supervising the case. Acidosis the result of lack of coöperation. And this in turn is followed by the *Treatment Period* during which the classic treatment of Joslin is carried out to the minutest details. The author then points out the nature, origin and rules for avoidance of acidosis. He next shows the absolute necessity for the frequent examination of the blood for sugar and CO_2 to determine the real status of the case and using this data for a guide to regulate the diet of the patient. Because of the inconstancy of the threshold point blood sugar determinations in all cases of diabetes mellitus are vital. A patient may be truly diabetic and may have kidneys relatively impermeable to sugar up to a very high point. Hence if only the urine were examined in such a case, the negative findings would not by any means justify us in eliminating the diagnosis of diabetes mellitus. On the other hand, the findings of abundance of sugar in the urine alone does not give us the real condition of the diabetic and the amount of starvation and dietetic treatment necessary to rid him of his glycosuria and his hyperglycemia. Ridding a patient with diabetes mellitus of glycosuria does not indicate that he is in a state of carbohydrate tolerance. We must reduce his blood sugar to some figure around the normal of 0.08 to 0.12 per cent. If we can make him sugar-free so far as the urine is concerned, together with a normal blood sugar content, then we have the case in a condition of the performance of a normal carbohydrate metabolism. Every patient that is afflicted with diabetes mellitus has the inherent right to have the very best treatment that the science of medicine can offer. Diagnosis is a science; treatment is an art. When we have to do with an art whose aim is the saving of human life, to fail to make ourselves master of it is a crime. [Author's abstract.]

Weil and Plichet. HIRSUTISM AND DIABETES MELLITUS. [Bull. et Mem. Soc. Méd. des Hôp. de Paris, March 10, 1921.]

Hirsutism is not infrequent, and diabetes is apparently increasingly prevalent, but the combined syndrome is comparatively rare. These authors report upon four cases, one of which came under their own observation. Of the three they find in the literature, that of Guemes showed slight and transient glycosuria. Tuffier's case showed abundant and persistent glycosuria, while in their own case there was a true diabetes accompanied by polydipsia, loss of flesh and polyphagia; it was complicated by fatal pulmonary tuberculosis. The association of diabetes with hirsutism, they maintain, is not a mere coincidence, quoting Laignel-Lavastine, who in examination of two cases of hirsutism without glycosuria, was able to detect latent disturbance of carbohydrate metabolism, shown by the appearance of glycosuria on injections of suprarenal extract, thyroid extract, or pituitary extract (extract of the whole gland or of the posterior lobe only), whereas in a control glycosuria was produced only by injection of the posterior lobe of the hypophysis.

Hirsutism, which is usually related to ovarian disturbance as well as by lesions of the suprarenals, is accompanied by other endocrine disturbances, such as glycosuria, obesity, and hypercholesterinemia. This diabetes is similar to that found in other diseases of the endocrine glands, such as in acromegaly or Graves's disease. Here involvement of the hypophysis or thyroid affects the hepatico-pancreatic system which is an important link in the chain of carbohydrate metabolism.

Kühl, W. PARATHYROID GRAFTS IN PARALYSIS AGITANS. [Münch. med. Woch., August 1921, LXVIII, No. 34.]

The Lundborg parathyroid paralysis agitans theory is here reviewed and subjected to a therapeutic test. The author took a case of paralysis agitans, which had been observed in the Altona hospital, from January to April 1921. He removed the parathyroid glands from two calves, which were placed in a warm, physiologic sodium chlorid solution. A quarter of an hour later he transferred them to the patient, embedding them under the abdominal skin at two different points. The results were surprising. Within two weeks a number of the symptoms were markedly ameliorated. Retropulsion was no longer observed after the eighth day; likewise, dragging of the feet in walking had almost disappeared; it was also noticeable that the play of the features was more normal. After two weeks he could lie down on the ground and rise unassisted, whereas before the operation he had always to be lifted out of bed. He could also fold his arms across his chest; could now feed himself, and he was able to spread out his fingers, whereas he had kept them either closed or stiffly extended. He was now able to write for the first time in three years. The author maintains that the muscular rigidity is related in some unknown manner to diminished parathyroid function.

Kramer, Tisdall and Howland. INFANTILE TETANY. [Am. J. of Dis. of Children, November 1921, XXII, No. 5.]

The concentration of inorganic phosphorus in the serum of tetany patients is returned to in this further research. The relationship between the sum of the univalent cations, sodium and potassium, and the divalent cations, calcium and magnesium, is specially investigated. In infantile tetany, the inorganic phosphorus of the serum shows, in about half the cases, that the concentration is average or slightly above. An increase in the inorganic phosphorus of the serum does not seem to be

responsible for infantile tetany. The ratio $\frac{\text{Na and K}}{\text{Ca and Mg}}$ is increased.

This is almost wholly due to a decrease in the concentration of calcium. The concentration of sodium and magnesium is essentially normal; that of potassium is slightly increased. The increased irritability of the neuromuscular mechanism, which is the essential phenomenon in infantile tetany, is due to the diminution of the concentration of calcium in the serum.

Pappenheimer and Minor. HYPERPLASIA OF PARATHYROID IN RICKETS. [J. of Med. Research, June-September 1921, XLIV, No. 4. J. A. M. A.]

The observations made by Pappenheimer and Minor bring additional evidence to bear in favor of the occurrence of parathyroid enlargement in human rickets. This increase in size is due to multiplication of cells, not to an increase in the size of individual cells. The parathyroids in children within the first eighteen months of life consist almost entirely of clear cells belonging to Type I. In human rickets there is no constant or characteristic change in the cell type, and the clear cell still remains markedly predominant. In the cases studied there was no increase in supporting tissues in the parathyroid gland in rickets, and no increase in vascular supply or congestion of the blood vessels not found equally in nonrachitic cases. The state of nutrition of the child had no bearing on the size either of the gland as a whole or of the individual elements.

Frontali, G. LARYNGOSPASM AND TETANY IN ADULTS. [Policlinico July 1921, XXVIII, No. 29.]

These clinical observations in young women revealed a periodic tendency. The recurrences always took place in the winter or spring, some without apparent cause, others following emotional excitement. Two followed coryza and were characterized by laryngospasm. Intubation was required in one instance, the spasm lasting for several hours and then suddenly disappearing. There was retention of calcium to 37.73 per cent of the amount introduced in an average of three days. Tests on the vegetative system with pilocarpin and atropin induced a pronounced reaction, while epinephrin elicited scarcely any response. The vagus was extremely excitable, with notable evidence of a vagotonia.

Farbargue-Vail, P. ELECTRODIAGNOSIS OF TETANY. [Schw. Arch. f. Neur. u. Psych., 1921 IX, No. 1.]

From an elaborate series of studies this investigator draws the conclusions that the type of calcium loss as seen in rachitis, tuberculosis, osteomalacia and senile changes produces different electrical signs. The electrical excitability of tetany is, he holds, specific.

Massaglia, A. C. FUNCTIONS OF PARATHYROID. [Endocrinology, May 1921, V, No. 3.]

The author advances some very complicated hypotheses regarding parathyroid functioning. They seem to reduce to simpler chemical combinations the still highly complex molecules which arise in the body's metabolism during pregnancy and the puerperium, or from gastrointestinal or muscle catabolism. He also maintains that an intoxication from a parathyroid hypofunction injures the kidneys, the liver, and the

nervous system; that there exists between the liver and the parathyroids an indirect functional correlation in neutralizing toxic substances which arise from the intestine. A parathyroid hypofunction in pregnancy or in puerperium is a pathogenic factor of which eclampsia is a visible sign.

Jeppsson and Klercker. PHOSPHATES IN SPASMOPHILIA. [Zeit. für Kinderheilkunde, March 1921, XXVIII, No. 2-4.]

This observation proceeded from a unique case in which a child of seven years invariably developed tetany with carpopedal spasm whenever sodium phosphate was given by the mouth. It showed no tetany signs at other times. He maintains that the spasmogenic substance is the salts in the whey, and probably only the alkaline phosphates, are responsible for the symptoms called spasmophilia. The research of Jeppsson, an assistant, demonstrated that children with latent spasmophilia were not affected by whey which had been deprived of its phosphates, and that all children displaying a tendency to spasmophilia had been getting an excess of alkaline phosphates. Chemical studies of the brain, muscles and bones after death showed large quantities of phosphorus. The property of the alkaline phosphates to reduce the calcium content of the tissues is an element in the dynamics of this type of poisoning.

Wernstedt, I. W. SPASMOPHILIA. [Acta Paediatrica, June 20, 1921, I, No. 2. J. A. M. A.]

Wernstedt's long study of the spasmophilic diathesis has apparently demonstrated, among other things, that the protein-free whey is the element in cows' milk that is responsible for the spasm-inducing action it sometimes displays. An artificial mixture of the same salts, in the proportion in which they are found in milk whey, also increased the tendency to spasmophilia. It is not an anaphylaxis but a salt action—a disturbance in the metabolism of salts. He adds that research should not be restricted to the parathyroids in studying spasmophilia, but other endocrine glands should be investigated in their relation to tetany. In a later study, December 15, 1921, in the same magazine Wernstedt declares that his research has demonstrated that the difference in the action of cow's milk and human milk on children with a tendency to spasmophilia is the result of the different relative proportions of salts and sugar in the two kinds of milk. The low sugar content in cow's milk allows the salts in the milk to exert too potent an action. On the other hand, the high sugar content of breast milk prevents its having a spasmogenic action. By adding 55 gm. of sugar to 1/3 liter of milk with 12 or 13 per cent cream, and adding water to 1 liter, we obtain a mixture that contains the ingredients of breast milk and in about the same proportions and calory value. With this mixture he has forged, he thinks, the last link in the chain connecting spasmophilia with the

ratio between the salts and sugar in the milk. The effect of this mixture on spasmophilia, he says, actually surpasses that of a change to breast milk. Among his other experiments were some with breast milk concentrated to one third or one fifth, thus bringing the salt content to equal that of cow's milk.

Bossert, O., and Gralka, R. MYOGRAPHY OF SPASMOPHILIA. [Jahr. für Kinder., 1921, XCIV, No. 3. J. A. M. A.]

Bossert and Gralka would restrict the term spasmophilia to children with overexcitable nervous system from constitutional causes. This type of true spasmophilia may be influenced by dieting. There is also an overexcitability left by infectious diseases. In a third group the cause of the overexcitability is still a mystery. The response of the muscles to electric tests confirms this classification. Abnormal parathyroid functioning modifies calcium metabolism, and this may entail a tendency to edema, the subcutaneous tissues imbibing water; also to carpopedal spasm from the musculature sharing in this imbibition. In contrast to the tetany group, is the group in which laryngospasm is the cardinal symptom; there is usually extreme hyperexcitability of the nerves while the muscle responses are like those in normal children. These children have been fed with cow's milk. The calcium deficiency in this group seems to be felt most in the brain. Quest noted in child cadavers with exceptionally low calcium content of the brain, that the children had all died from convulsions. The prognosis depends on the special organ involved. In rachitis it is the bones that suffer most from the deficiency of calcium; in tetany, the muscles; with laryngospasm, the nervous system, and with convulsions, the brain. These various types may be amenable to dietetic and medical measures, the overexcitability subsiding with the other symptoms. Myographic curves of each type are reproduced.

Drüner. PARATHYROID TRANSPLANTATION IN POST-OPERATION TETANY. [Zentralbl. f. Chir., February 19, 1921.]

The author here describes the results of his study of the parathyroids in the cadaver since it is difficult to recognize the parathyroids macroscopically. Tissues supposed to be parathyroid were removed from about twenty corpses, imbedded, and cut in serial sections. In the first two cases three parathyroids and in the third four parathyroids were found. In more than a third of the remaining cases the tissues removed proved to be small lymph glands or fragments of goiter. The parathyroid glands therefore cannot be identified by their topographical anatomy. Moreover, owing to the possibility of mistaking a lymphatic gland for a parathyroid, there is a possibility of transplanting a tuberculous lymph gland, so that the operation is not only uncertain but also dangerous without a histological checking. Lastly, owing to the highly organized circulation of the parathyroid, an injury to it may be sufficient

to impair the vitality of the glands. Transplantation, therefore, is not likely to be successful if this circulation is not reestablished after the operation.

Levison, P. TETANOID NEUROSES. [Ugeskrift for Laeger, September 22, 1921, LXXXIII, No. 38.]

In this clinical contribution the author calls attention to a tendency to make a (faulty) diagnosis of hysteria less often because of a deepened insight into intermediary mechanisms in which abortive cases of organic nervous or endocrine disease are possible. These used to be and still are (faultily) labeled neurasthenia or hysteria. He describes some cases which establish that the parathyroid glands may be responsible for a similar incomplete or abortive set of symptoms. The superficial clinical picture is that of a neurosis, but with a trend to tetany. In one of three such cases described there were signs of other endocrine derangement. Lassitude, restlessness, depression, insomnia, pains and paresthesias, with loss of weight, falling of the hair, goiter, polyuria, and the Chvostek, Erb and Hoffmann signs; this grouping of symptoms points to faulty parathyroid functioning. They are liable to be mistaken for mild exophthalmic goiter or myxedema, and in fact these tetanoid neuroses may be associated with either. Treatment as a rule is quite effectual, that is, calicum in large doses, best in the form of calcium chlorid, 2 gm. three times a day. Parathyroid substance itself was of no service in therapy. The method of taking is not yet worked out.

Bergstrand, H. PATHOLOGY OF PARATHYROID GLANDS. [Acta Medica Scandinavica, May 6, 1921, LIV, No. 6.]

This is a complete résumé of recent studies of the pathology of the parathyroid, with extensive bibliography and some personal researches drawn from the section of 200 cadavers. Tumors and hyperplasias are first reviewed. In one case the parathyroids were much enlarged while the thyroid was partially atrophied, suggesting compensatory hyperplasia. Hyperplastic enlargement of the parathyroids has been found accompanying osteomalacia in so many cases that some definite relationship between them seems plausible, although in osteomalacia the picture is not so frequent. Parathyroid hyperplasia also accompanied nephritis, tetany, eclampsia or epilepsy. In fifty cases of nephritis, one or more parathyroids were enlarged in ten cases. In one in this group there was considerable calcium in the kidneys. Little is known in regard to the elimination of calcium by the kidneys in nephritis. The cases of "renal dwarfism" associated with chronic nephritis with genu valgum point to a possibility of a connection between kidney functioning and the genu valgum. Several instances of death after an operation for genu valgum have been published, including Erdheim's case in which one parathyroid was markedly hyperplastic.

Melchior. TETANY. [Mit. a. d. Grenz. d. Med. u. Chir., 1921, XXXIV, No. 3.]

This observer is satisfied that the tetany problem is a subtle one and not so simple as many observers have seemed to make it. He falls back upon Constitutional Pathology as explaining the many questions of undernutrition, osteomalacia and tetany, spontaneous or post operative. Many contradictory phenomena can be explained only by assuming constitutional factors. His clinical contribution deals with fatal parathyroprival coma, of which he cites some instances from the records and a personally observed case. Visceral and secondary tetany are also discussed. Two cases of spasm of the stomach are described, and one of visceral tetany accompanying gallstones, with one of cardiospasm and one for which hysteria is the best generalization.

II. SENSORI-MOTOR NEUROLOGY.

3. SPINAL CORD.

Elsberg, Charles A. THE DIAGNOSIS AND SURGICAL TREATMENT OF TUMORS IN FRONT OF THE SPINAL CORD. [Surgery, Gynecol., and Obstetrics, December 1921, XXXIII, p. 670 (9 figs.).]

The symptoms of tumors growing on the anterior surface of the spinal cord—whether extradural or intradural—are difficult to differentiate from intramedullary growths. Hence there is often delay in surgical interference, and the exposure and removal of these tumors is often difficult. Their onset is usually painless: muscle atrophies are often the first sign, as in the small hand-muscles in cervical growths. There may be few or no sensory disturbances: and when sensory loss does appear it is often noticed by the patient first in the lower limbs. In some cases there is a slowly increasing spasticity of the lower limbs for many years without any sensory loss. As pain- and temperature-sensibility may be disturbed first, the clinical picture of muscle atrophies with dissociated sensory disturbances may be that of intramedullary disease. In syringomyelia and in intramedullary growths sensory disturbances usually precede the muscle atrophies. Whereas in intramedullary growths an upward shifting of the level signs is not rare, in anterior spinal tumors the level signs remain constant. Though in the latter tumors these level signs may be wanting, when they do appear they increase rapidly. For the removal of these anterior tumors the laminectomy must be extensive. In the cervical region the wide removal of the lamina on one side allows of a direct approach to the growth. In the dorsal region the base of the transverse processes must often be removed. In intradural growths, after dural incision and location of the growth, a slip of the dentate ligament on the side of approach is grasped with mosquito forceps, the slip cut free from its

attachment to the inner surface of the dura, and traction made on the forceps. By this means the spinal cord is raised out of its bed, drawn to the other side, and partly rotated. If the tumor be found to be extradural, one of two methods should be followed. The entire dural sac may be drawn to one side and the tumor thus exposed: venous bleeding may be profuse, and measures used for its control may cause much pressure on the cord, especially if the tumor lies near the mid-line in front of the dural sac and cord. In these cases Elsberg performs a transdural operation with good results: after the opening of the dural sac and the drawing of the cord to one side he incises freely the anterior layer of dura, and thus exposes and removes the growth. The edges of the incision in the anterior dura are then allowed to fall together without any sutures. He finds that this transdural approach endangers the cord less than the extradural procedure. [Leonard J. Kidd, London, England.]

Monrad-Krohn and Saethre. CLINICAL OBSERVATIONS BEARING UPON THE CENTRIPETAL PART OF THE PATH OF THE ABDOMINAL REFLEXES. [Norsk. Mag. f. Laegev., February 1921.]

In a monograph on the abdominal reflexes published in 1918, one of us maintained that the centripetal part of the reflex arc corresponds to the uncrossed fibers of the posterior columns, basing this supposition on clinical observation of the reflexes in a case of Brown-Séquard's syndrome. Curiously enough only one case of this syndrome, sufficiently well observed to be recorded, was to be found amongst the 472 cases examined. The present three cases here recorded are of interest inasmuch as they show, as did the case mentioned above, that the centripetal part of the reflex arc is not identical with the centripetal fibers conducting impressions of pain and temperature.

In all the cases we found the abdominal reflexes present on the side of the hemihypoalgesia and hemihypothermesthesia, whilst on the other side they were absent. Their absence on the side of the motor loss proves nothing, as the pyramidal lesion may be solely responsible for this [the pyramidal tracts in all probability representing the centrifugal part of the reflex arc]; but from the fact that they were present on the side of the loss of the sense of temperature and pain one may conclude that the fibers conducting these sensory qualities have nothing to do with the centripetal part of the reflex arc. In accordance herewith it is natural to assume that the centripetal part of this cerebral [probably cortical] reflex arc is to be found in the uncrossed fibers of the posterior columns. [Authors' abstract.]

Pollock, Lewis J., and Davis, Loyal E. INJURIES OF THE SPINAL CORD. [Illinois Medical Journal, September 1921.]

Particular importance is to be placed upon the relatively frequent observation of severe injury and, at times, incomplete section of the

spinal cord, with an intact dura mater. Of some clinical importance is the observation of lesions occurring at a considerable distance from the level of the injury. In cases of complete section of the spinal cord, it has been observed that there are two types of changes in the lower segment which are fairly characteristic. Special attention has been called to them by Lhermitte, who, without so designating them, describes, as the first, what is known as axonal degeneration in the cells of the anterior horn, particularly in Clarke's column.

Another very consistent change extending throughout the length of the lowermost segment is a glial and ependymal cell infiltration about the central canal. Contrasted to these changes, the upper segment shows for a considerable distance, the well-known Nissl changes in the ganglion cells and an absence of pathology about the central canal.

Of clinical importance is the fact, attention to which had been called by Head, that as the fibers for pain and temperature sense ascend, they occupy a lamellar position. From Holmes' study of unilateral lesions of the spinal cord, where at times he found caudal retreat of the analgesia in recovering lesions, or a preservation of sensibility in the lowermost lumbar and sacral segments in others, it could be concluded that the fibers from the lowermost segments occupy a position lateral to those from the upper. We have observed in cases of intramedullary tumors the fibers for pain, heat and cold each seem to occupy a certain lamellar area so that certain segments are sensitive to pain, more to heat and most to cold. This is particularly true of intramedullary tumors of the upper dorsal region; wherein it can be concluded that the fibers are distributed from within outwards as to pain, heat and cold.

Of great interest has been the concomitant occurrence of injuries to the brachial plexus. These have consisted of two forms. The first follows a through and through gunshot wound of the neck, wherein the soldier falls with a paralysis in all extremities, motion returning in one arm and leg soon after the injury, leaving a flaccid paralysis of the other arm and a spastic paralysis of the corresponding leg with loss of pain and temperature sense on the opposite side of the body. After a variable time, the paralysis in the leg disappears, leaving a permanent flaccid paralysis in the arm. In the other type, the patient sustains an injury to the brachial plexus and several days or weeks afterwards, develops a slowly progressive paralysis of the leg on the same side with a loss of pain and temperature sense in the opposite side. In such cases it is necessary to determine whether the flaccid paralysis of the arm is due to a brachial plexus lesion, a root lesion or is one of the anterior horns. If the lesion is one of the brachial plexus, the loss to touch will be more extensive than the loss to pain. If it is one of the roots, the loss to pain will be more extensive than the loss to touch. If finally, it is due to a lesion of the gray matter and the sensory loss is the result of the interruption of ingoing fibers, light touch as well as deep touch will be absent and pressure pain as well as prick pain will

be absent. If it is due to a brachial plexus lesion, frequently the lowermost segments showing sensory loss may be two or more segments above the level of the sensory loss on the opposite side. Finally if the paralysis in the leg disappears relatively soon and the paralysis of the arm persists, it speaks for a brachial plexus lesion as against a spinal cord lesion. [Authors' abstract.]

Rennie, G. E. SYMPTOMATOLOGY OF COMPLETE TRANSVERSE LESION OF SPINAL CORD. [Med. Jour. of Australia, March 1921, I, No. 10.]

Riddoch and Walshe have stated that: "One of the diagnostic points in complete transverse lesions of the cord is the absence of extensor spasm, while they are present in cases of incomplete lesions." Rennie doubts this on the strength of his experience. It can no longer be maintained that extensor tone depends on intactness of the extra-pyramidal tracts. If these be divided, postural or extensor tone is not always lost, he maintains. A complete transverse lesion of the cord, he says, can be diagnosed only when there is a permanent loss of all voluntary movements below the level of the lesion and a parallel loss of all forms of sensation below the level. If the lesion be in the dorsal region, a further confirmation of a complete lesion is the loss of all sensations from the abdominal viscera and loss of sensation of the functioning of the bladder and rectum. He says that no reliance can be placed on the tendon jerks or of the cutaneous reflex arc. The presence or absence of tone in any one group of muscles is not uniform, though an increased tone in the flexor group and a diminished tone in the extensor group of muscles points, in the majority of cases, to a complete transverse lesion.

Oudard and Jean. FRACTURES OF THE LUMBAR TRANSVERSE PROCESSES. [Bull. et Mém. Soc. de Chir. de Paris, May 24, 1921.]

Thirty-one cases, seven of which are original, are here analyzed. The authors state that, with the exception of a study by Tanton (*Revue de Chirurgie*, 1910) no monograph has appeared on this subject. In most cases only a single transverse process is fractured. When there are multiple fractures the neighboring transverse processes on the same side are involved. In only one case were both the transverse processes of the same vertebra fractured. The transverse process of the first lumbar vertebra is most frequently affected, as it is most exposed to direct trauma. As regards the etiology, most of these fractures have been observed in adult males, the injury being of various kinds, such as the falling of a mine, or a fall from a bicycle or out of a carriage. In all such cases there is a direct shock to the lumbar region. In another group of cases there is no direct shock to the lumbar region, but a fall on the feet or a violent effort with sudden stretching of the lumbar muscles. The most constant symptom is pain in the lumbar region on the side of the fractured transverse process. The pain, which is usually

very violent, is exaggerated by the least movement of the trunk, and may radiate to the thigh and leg, or on the other hand, be masked or modified when there are coexistent visceral lesions, such as contusion of the kidney, rupture of the intestine, etc. On palpation there is great tenderness in the lumbar region. No ecchymosis or deformity as a rule is seen, but the patient adopts a characteristic attitude, the vertebral column being extended and inclined to the affected side so as to relax the muscles which are inserted into the injured transverse processes. Complications may occur, such as necrosis of the fragment with abscess formation, contusion of the kidney, and rupture of a coil of small intestine. Treatment consists in immobilization in bed, an apparatus or traction being unnecessary. An immediate operation is not required, but intervention may be needed if the pain remains severe after a month and radiates along the lumbar nerves.

Branham and Lewis. CASE OF MULTIPLE MYELOMA WITH UNUSUAL FEATURES. [Med. Rec., June 29, 1921, XCIX, No. 5. J. A. M. A.]

In the case cited by Branham and Lewis symptoms simulating brain tumor with pronounced unilateral exophthalmos were manifested. The true nature of the case remained unrecognized until the necropsy. The history dated back thirty-seven years when the patient was admitted to the hospital suffering from auditory hallucinations, periods of intense psychomotor activity, and a general dementia of moderate grade. This condition obtained over a period of many years, the stages of unrest becoming less frequent and less stormy and the apathetic stretches more in evidence. Irritability superseded excitement as the dementia progressed beyond the stage of active hallucinosis. His physical condition remained excellent throughout. Twenty-four years later, in 1906, the patient jumped over the stair banister and sustained a severe contusion of the right ankle and hip. This responded well to treatment and apparently no complications developed. May 2, 1916, the patient had a swollen face, some elevation of temperature, and headache. The condition was provisionally diagnosed as dental caries and a tooth was extracted. July 21, 1916, a more severe attack confined him to bed, his face being swollen to the extent that the right eye was completely closed. This attack lasted six days. February 12, 1917, a third attack of two weeks' duration occurred, in which the entire face and neck were involved. A maximum temperature of 103° F. was attained. The condition was diagnosed as erysipelas. A similar attack took place November 17, 1917, more severe than its predecessors. September 29, 1919, for the first time the patient complained of pain in his right leg. Examination showed enlargement of the right hip with no evidence of a tumor growth. A moderate degree of tenderness was present. Three weeks later exophthalmos of the left eyeball was noticed; although there were no signs of general intracranial pressure, a brain tumor was suspected. Impairment of vision was noted early. A well defined im-

movable tumor, the size of a hen's egg, over the region of the right trochanter was present by this time. The patient died December 22, 1919. Tumor growths were found in the lumbar lymph glands, the neck of the femur, left parietal bone and right ilium. Attention is directed to the element of trauma in this case.

Wallgren. INVESTIGATIONS ON MYELOMA. [Upsala Läk. Föhand., September 15, 1920, XXV, No. 3-4. J. A. M. A.]

Wallgren collected sixteen cases and studied them very exhaustively in the light of clinical and histologic data. He interprets the etiology as a systematic metastasis, the manifestations as a tumor, and points out the close similarity of the latter to sarcoma, while he surmises its true nature to be a form of pseudoleukemia. The diagnosis rests on the presence of the Bence-Jones albuminous bodies in the urine. A combination of rheumatism and albuminuria always should be regarded with suspicion. The Bence-Jones albuminous substances coagulate at 50-60 C. and dissolve again at a temperature close to the boiling point, the exact temperature points varying with the percentages of salts and acids in the urine. This Bence-Jones protein is found in various diseases of the skeleton, notably in cancer and in lymphatic leukemia, and may originate from a degenerative process in the bone marrow due to enzyme action. The myeloma lesions are nearly always within the trunk, not in the extremities, and the initial locality is within the bone marrow. Spontaneous fractures in older individuals should be regarded with suspicion. The prognosis is unfavorable. The progress of the pathologic process may be retarded by radiotherapy or organotherapy, but no specific treatment is known. Death usually results from some complication. Ten plates and an extensive bibliography accompany the paper, with compilation of the few cases on record.

Turner, W. G. MYELOMA OF VERTEBRÆ. [Journ. of Orth. Surg., December 1921, III, No. 12. J. A. M. A.]

In the two cases reported by Turner pain in the back was the dominant complaint; one patient was seventy-five and the other forty years of age. In the first case the pain was referred chiefly to the lumbar region, third and fourth vertebræ, also to the dorsal region, sixth, seventh, eighth and ninth vertebræ and to the right about four inches along the sixth, seventh and eighth ribs. No deformity of the column was present. Dorsal decumitus gave some ease, ventral decubitus increased the pain. The tenderness was over the same regions but varied in intensity when tried three or four times. No girdle pain. Reflexes normal; no sensory change; abdomen and thorax negative. The patient failed gradually and died in coma. Superficial examination of the vertebral column revealed only slight enlargement of the lumbar vertebræ without any deformity. On longitudinal section only a peripheral shell—very thin—of bone remained. The vertebræ were re-

placed by a soft reddish brown (myeloid) tissue. The intervertebral disks were relatively intact and these, with the external shell of bone, held the column together. A similar but less extensive process involved the ribs. The clinical cause and pathology of the second case was similar to that of the first case.

Sundberg, C. G. STUDIES ON SENSIBILITY IN FRIEDREICH'S DISEASE. [Upsala Läk. For., XXVI, 1921, September 5-6.]

The author has examined the sensibility in ten cases of Friedreich's disease in different stages (duration of the disease from two to seventeen years). Some kind of disturbances of sensibility was noticed in all cases. The more advanced the stage of ataxy was, the more pronounced were the disturbances. The disturbances consisting in a diminution of one or more sensory qualities were most obvious in the distal parts of the extremities and more pronounced in the lower than in the upper extremities. Pains and paresthesia did not occur in any case. The power of appreciating passive movements was disturbed in all cases. In the earliest there was only some uncertainty in the toes, in some of the more advanced cases even the knees and the elbows were affected. The compass-test gave considerably heightened values in five of the six cases examined: the sixth case was, however, in an early stage of the disease. The power of localizing single impressions of touch was not in any case obviously diminished. The stereognostic power was in no case disturbed. The pain and touch senses show slight disturbances in five cases, all with advanced ataxia. The temperature sense showed in two or three cases a disturbance analogous to that of the pain and touch senses. One case showed furthermore the following disturbance: everywhere, but especially in the extremities, abnormally sparse cold points, which reacted less readily and more irregularly than normally; further enlarging of the breadth of indifference but normal threshold to discrimination. Another case showed similar disturbances although in a less pronounced degree. [Author's abstract.]

Cadwalader, W. B. EARLY APPEARANCE OF SYMPTOMS OF COMBINED SCLEROSIS OF THE SPINAL CORD AND THE SUBSEQUENT DEVELOPMENT OF SEVERE ANEMIA. [Pennsylvania Medical Journal, July 1921, XXIV, No. 10.]

In the majority of cases of pernicious anemia the spinal cord is affected. The evidences of such involvement are, however, so often entirely overshadowed by the severity of the symptoms of anemia as to be overlooked. Nevertheless a considerable number of cases occur in which the spinal cord involvement is so pronounced as to give rise to more marked discomfort than is produced by the anemia alone. Moreover the cord may be severely affected long before the characteristic alterations in the blood can be demonstrated. It is to the latter type of case that particular attention is called.

Owing to the striking regularity and constancy in the development of the symptoms of spinal cord involvement the clinical diagnosis can be made with great accuracy, for in the combined sclerosis of the spinal cord associated with anemia the degeneration affects particularly the posterior columns. It is peculiar in that it begins in the more medianly situated fibers; that is to say, it appears first in the long fibers of the posterior, or Goll's, columns and in the parts adjacent to Burdach's columns. In consequence, in the earliest stages of the disease deep sensation alone—more particularly bone sensation and the sense of muscular position—is disturbed. Because of the involvement of the lateral columns the tendon reflexes may be exaggerated. In an article published in the *JOURNAL OF NERVOUS AND MENTAL DISEASE* of November, 1916, Dr. Cadwalader discussed the diagnosis of this condition in detail; hence it is not dwelt on here. He points out, however, that this type of sclerosis occurs and can be recognized long before the anemia develops. In such cases severe anemia invariably develops later, although it may not at first conform to any particular type. Sooner or later the condition progresses and takes on all the characteristics of pernicious anemia. As a rule, in spite of treatment, it terminates fatally. By the early recognition of the cord involvement a subsequent fatal anemia can be anticipated. So far as is now known, this classic type of combined sclerosis does not occur in association with any form of anemia other than that of the pernicious type, although it has been described as occurring in rare cases with gastric carcinoma and in Addison's disease.

Dr. Cadwalader reports the following cases: Case 1, presented in November, 1919, moderate ataxia impairment of bone sensation, impairment of the sense of muscular position, moderately increased reflexes, and preservation of all other forms of sensation. The blood count showed: erythrocytes, 4,200,000; leukocytes, 6,600; hemoglobin, 70 per cent. The differential count was normal. In April, 1920, the ataxia and the loss of bone sensation and of muscular position had increased and were so marked as to make standing and walking impossible. His hands were so severely affected that he could use them only with difficulty. In spite of this increase in the severity of the symptoms the anemia was not so marked: hemoglobin, 59 per cent; erythrocytes, 3,224,000; leukocytes, 6,000; differential count normal. Later the anemia became so intense as to render his condition critical.

Case 2, seen in the wards of the Presbyterian Hospital, presented the usual evidences of combined sclerosis. The symptoms developed most suddenly for the patient stated that he was unable to walk without a cane in about one week's time. At first the blood showed no evidence of anemia: hemoglobin, 72 per cent; erythrocytes, 4,340,000; leukocytes, 6,800. Six months later, however, the blood showed: hemoglobin, 28 per cent; erythrocytes, 1,220,000; leukocytes, 3,200.

In still another case the patient complained of severe paresthesia of the hands and of very slight incoördination of the lower limbs. In spite

of this he continued in active business for three years, and then developed a severe anemia that rapidly proved fatal.

Dr. Cadwalader stated that many examples similar to those just described might be collected.

The actual exciting cause of pernicious anemia has not as yet been discovered, but the occurrence of spinal cord disease without the concomitant anemia would seem to indicate that, when it does develop, the anemia is merely the most conspicuous feature of a disease that affects the spinal cord as well as the blood-forming tissues. It is certainly incorrect to attribute the spinal changes to the anemia alone, *i.e.*, using the term anemia to indicate quantitative alterations in the blood elements. There can be no doubt, however, that the constant localization of the lesions to certain areas of the spinal cord is not brought about in a haphazard fashion during the course of a general disease.

In an interesting article by Orr and Rows (*Brain*, Vol. XVI, Part I, 1918) an attempt is made to show that so definite a localization as is seen in these cases can be connected with the spinal distribution of the thoracic and lumbar sympathetic systems which exert an influence upon the blood vessels that supply the lateral and posterior columns of the cord.

In conclusion, Dr. Cadwalader emphasizes again the importance of recognizing a group of cases in which the classic picture of combined sclerosis of the cord usually associated with severe anemia is presented, but in which the anemia is absent. In all these cases, however, a severe or fatal anemia will probably develop during the course of the disease. [Author's abstract.]

André-Thomas. INCOMPLETE COMBINED SCLEROSIS WITH SLOW GAIT, REGRESSIVE AND WITH RELAPSES. [*L'Encéphale*, September-October 1921.]

Observation comparable to the syndrome of the longitudinal fibers of Dejerine, differing in its evolution and its benignity. The symptomatology is manifest in disturbances of sensibility, abolition of the reflexes, incoördination. The anesthesia chiefly affects deep sensibility, conserving tactile sensibility (excepting the discrimination of Weber's circle test) and sensibility to pain, slightly involving also thermic sensibility. Wassermann negative in the blood and the cerebrospinal fluid lymphocytosis 0, albumin 0.50. Each relapse has been checked by specific treatment, mercury-arsenic. Seven years after beginning it still persists with abolition of the tendon and bone reflexes, with slight diminution and retardation of thermic sensibility in the fingers and toes. [Author's abstract.]

Sharp, E. A. ARTIFICIAL PNEUMORACHIS. [*Arch. of Neur. and Psychiatry*, December 1921, VI, No. 6. J. A. M. A.]

Of sixty-four patients treated by artificial pneumorachis (intraspinal injection of air or oxygen) by Sharp, twenty-eight have died. In the

meningococcus meningitis cases only the severe and apparently unfavorable cases were treated by this method. The mortality of 23 per cent compares very favorably with the statistics of all cases of meningococcus infection in which the antimeningococcus serum is used alone. The mechanical effect of the gas in opening secluded pockets of infection has undoubtedly prevented relapses as none of the patients who have recovered have had a recurrence such as occasionally occurs in other cases. The average amount of oxygen injected has been from 10 to 15 c.c. The technic employed is the ordinary procedure of lumbar puncture with the patient lying on the side. After removal of as much fluid as will flow through the needle, the oxygen is injected by means of a 20 c.c. Luer syringe. The oxygen is injected slowly, using from 5 to 10 c.c. as measured on the syringe. Removal of the syringe allows the gas and fluid to escape in a frothy mixture. Injection of the gas is repeated and the head and shoulders slightly elevated to allow the gas to reach the cerebral ventricles. This results in additional fluid escaping when the syringe is removed.

Banchieri, E. RHIZOMELIC SPONDYLOSIS. [Policlinico, May 1921, XXVIII, No. 21.]

In Banchieri's case the cerebrospinal fluid of the workingman of forty-eight with ankylosis of the spine was yellowish and coagulated on standing. Banchieri ascribes etiologic importance to the man's syphilis. This assumption was confirmed by the subsidence of the pains and inflammation under specific treatment although the ankylosis was not modified. The spinal disease had developed at once after a fall. He regards the trauma as having merely rendered manifest the latent disease.

Wechsler, I. S. BULBAR AMYOTROPHIC LATERAL SCLEROSIS. [Neur. Bull., February 1921, Vol. III, No. 2, p. 82.]

The author reports two cases of amyotrophic lateral sclerosis with bulbar involvement, which showed somewhat unusual features. The first was that of a man of forty-five who began with difficulty of movement in both hands, gradually leading to atrophy of the small muscles. Added to this he showed a typical myotonic symptom in the right hand, that is he could open it only with difficulty after voluntarily making a fist, and he had to use the left hand in opening the right. This was not due to paralysis of the extensors. The condition was erroneously diagnosticated at first as myotonia atrophica. The general condition rapidly progressed until he showed a fairly typical form of amyotrophic lateral sclerosis with marked involvement of the bulbar nuclei, atrophy of the tongue, fibrillations, atrophy of the masseters and hands, exaggerated deep reflexes. The unusual feature was the myotonic symptom.

The second case was that of a woman of forty-six whose chief complaint was tremor of the fingers, difficulty in speaking, stiffness of the

tongue, choking feeling in the throat, difficulty in sipping liquids. Examination showed fibrillations in the lips and tongue, weakness of the jaw muscles, paresis of the right face, inability to protrude the tongue, paresis of the palatal muscles, bulbar speech and emotionalism. All the deep reflexes were extremely exaggerated. The patient's condition progressed very rapidly so that within a few months she showed typical bulbar symptoms and general signs of pyramidal tract involvement, which spoke for an amyotrophic lateral sclerosis. The cervical cord gradually began to show signs of involvement of the anterior horns. The unusual features were the primary involvement of the bulbar nuclei, with downward progress into the cord and very rapid course of the disease.

Both patients had very marked pyorrhoea, but whether secondary to the amyotrophy of the face and tongue or primary (?) will not be said. Attempt at autovaccination with cultures made from the pyorrhoea were unsuccessful. Another feature in both patients was the absence of the Babinski phenomenon—a feature common to many cases of amyotrophic lateral sclerosis despite the involvement of the pyramidal tracts. [Author's abstract.]

Wilson, G., and McIver, J. POSTEROLATERAL SCLEROSIS IN ANEMIA. [Penn. Med. Journ., December 1921, XXV, No. 3.]

This clinical paper reports some cases seen in patients who were past fifty years of age. The onset is gradual and fairly uniform. Paresthesia and a gradual increasing weakness in the lower extremities particularly are the chief initial happenings. The characteristic motor and sensory losses are as follows: Pyramidal tract involvement with the loss of the sense of position and of vibration then develop. The spinal cord syndromy may obtain with slight blood changes. They hypothecate a toxin which acts on the cord before it does on the blood.

Schippers, J. C. ESSENTIAL HEREDITARY TREMOR. [Nederlandsch Tijdschrift voor Geneeskunde, January 29, 1921, 591.]

Schippers reports a case of the essential hereditary tremor of childhood in a boy, now aged fourteen. He was always very nervous, and on two occasions, when seven years old, two attacks of sudden loss of consciousness were observed by the home physician who thought he would certainly exclude epilepsy and hysteria also. He was a boy of very powerful build, and had a somewhat stiff gait, lively reflexes, and a fine tremor in both arms which increased slightly on emotion; he had also a slight right congenital ptosis. The genitalia were rather large, but there were no signs of premature puberty. Negative roentgen and serological examinations. Several of his brothers and sisters showed tremors, and these had occurred also in the two previous generations.

The boy hardly answers to the French "tremor of degenerates," for, although he comes from not very favorable surroundings, he is now

removed from parental authority, and his degeneration is not at all pronounced. His conduct and his bodily condition are now, at the age of fourteen, very satisfactory. [Leonard J. Kidd, London, England.]

Hamilton and Nixon. SENSORY CHANGES IN SUBACUTE COMBINED DEGENERATION OF PERNICIOUS ANEMIA. [Am. Archives of Neur. and Psychiatry, July 1921, VI, No. 1. J. A. M. A.]

Changes in the nervous system, Hamilton and Nixon state, occur in pernicious anemia in from 70 to 80 per cent of the patients as they present themselves in the ordinary physician's practice. The frequency of these changes is ordinarily underestimated. Subjective sensory disturbances constitute the earliest and most frequent evidence of involvement of the nervous system. These, with the objective signs also, are often the earliest evidence of the development of pernicious anemia. The most characteristic sensory findings are the relatively greater loss of deep as compared with superficial sensibility, but there is by no means normal sensibility to touch, prick and other forms of superficial sensibility. Almost equally as characteristic as the change in deep sensibility, is the complaint of subjective sensory disturbances. There is a distinct lack of parallelism between the severity of the blood and nervous phenomena, and either may precede the other by a long period of time. Moreover, marked remissions in the blood picture, either with or without splenectomy, may fail to show a betterment in the sensory disturbances equal to that in the blood, and may show none at all. Contrary to the generally expressed opinion, degenerative changes in the peripheral nerves are common in pernicious anemia and constitute an important part of the pathologic anatomy of that disease. These changes in the peripheral nerves may serve to explain the disharmony between the sensory phenomena and the changes in the spinal cord existing in certain cases.

Mingazzini. FAMILY SPASTIC PARALYSIS OF SPINAL TYPE. [Am. Archives of Neurology and Psychiatry, June 1921, V, No. 6.]

A clinical report of a family in which two brothers and a sister, the offspring of a tabetic father, at about puberty began to develop motor disturbances of the lower extremities terminating in the syndrome of family spastic paralysis (spinal type). Optic atrophy, choroiditis and double cataract was present in one of the boys.

Phillips, Berry and Snock. RECOVERY FROM RABIES, WITH REPORTS OF CASES OF TREATMENT PARALYSIS AND OF RECOVERY OF ANIMALS APPARENTLY RABID. [Journ. Infect. Dis., 1921, XXIX, No. 97.]

Spontaneous recovery from naturally acquired rabies does occur, although it appears to be extremely rare. The saliva of an animal which recovers from rabies may have been extremely virulent during the course of the disease. As early as thirty-eight days after recovery from street rabies in a dog, the infectivity of the brain may disappear and Negri

bodies be absent. And that therapeutic measures to control the symptoms in developed rabies in man should not be so heroic as to themselves endanger the life of the patient, for there is a possibility of recovery.

Mallet, R. RABIES AFTER PASTEUR TREATMENT. [Bulletins de la Soc. Méd. des Hôp., February 25, 1921. J. A. M. A.]

Mallet reports a case which warns of the necessity for keeping the patient under supervision after Pasteur treatment, and giving another course of injections when the slightest signs of anything abnormal develop. Particularly instructive in this line is pain at the point where the subject had been bitten, also periods of unusual depression or gaiety or of each in turn. This patient had been bitten in the face and three days had elapsed before treatment was applied.

Remlinger, P. TYPHOID DELIRIUM SUGGESTING RABIES. [Paris Médical, July 1921, XI, No. 31.]

A clinical record of a man of thirty with initial manifestation of a rapidly fatal typhoid as was proved later began with a classical picture of rabies.

Semerak, C. B. NERVOUS SYSTEM IN BOTULISM. [Jour. Infect. Dis., August 1921, XXIX, No. 2.]

This is a pathological report of a serial study of the brain stem in a case of botulism which occurred in a girl, seventeen years of age. The vascular system seems to show the chief lesions. Thrombosis in arteries and veins is followed by necrosis and then by a secondary inflammatory reaction. The poison seems to have no direct action on the nerve parenchyma. Changes here are secondary. The motor cranial nerves are chiefly involved because the vertebral arteries seem to be thrombosed very markedly.

Regan, J. C. SECONDARY INFECTIONS IN POLIOMYELITIS. [Arch. Pediatrics, May 1920. Jl. Aust.]

The occurrence of mixed infection constitutes a possible source of danger in the hospital treatment of all infective diseases. This was considered to be particularly acute in the hospitalization of patients with poliomyelitis during the 1916 epidemic in New York, when large numbers of children with this disease were admitted to hospital, at an age when they were most susceptible to the various infective maladies from areas where these diseases were prevalent. Certain symptoms, such as rashes of scarlatiniform type, heavily coated tongue, congested throat and occasional minute spots on the buccal mucosa which occur in poliomyelitis, caused confusion at first and a number of patients were isolated on account of suspicion of measles and scarlet fever. As the epidemic progressed, it was noted that secondary infections rarely developed after admission—only 15 or 0.83 per cent of the total number

admitted. These 15 cases included nine of pertussis, three of diphtheria, one of measles, one of scarlet fever and one of varicella. No secondary cases occurred in the wards in which these cases appeared, though the majority of the children present were unprotected by previous attacks. Not only was mixed infection of poliomyelitis with other contagious diseases slight, but the number of patients admitted with double infections of this and some other infective process was also small — 17 in all, or 0.94 per cent. Thus out of a total of 1798 patients with poliomyelitis, there were only 32 who had, on admission or later, another disease, giving an incidence of 1.72 per cent. Of these 32, there were 22 with pertussis. Deducting these cases, the incidence is reduced to 0.59 per cent. From these facts and figures J. C. Regan considers that children with poliomyelitis are not as susceptible to other contagious diseases as normal children, with the possible exception of pertussis. This was the only infection prevalent among the poliomyelitis patients during the epidemic. This temporary relative insusceptibility may be based on certain fundamental principles of bacteriology. He assumes that infection with the virus of poliomyelitis induces certain changes in the tissues of the infected individuals, due possibly to products of the growth of the organisms, which render them unsuitable for the development of the causal agents of other acute infective processes. In other words, a condition of antagonism exists. The only germ which seems clinically to have a working relationship with that of poliomyelitis is the bacillus of whooping cough. The influence of poliomyelitis on the symptomatology of scarlet fever, varicella, diphtheria, morbilli and parotitis seems to be negligible with the one exception, that symptoms of the associated diseases are milder than usual. He states that the mortality rate of these infections was remarkably low, *viz.*, 3 per cent, compared to 23.79 per cent in the uncomplicated poliomyelitis cases.

Rugh, J. T. SURGERY OF INFANTILE PARALYSIS. [Annals of Surgery, July 1921, LXXIII, No. 1. J. A. M. A.]

While the surgery of infantile paralysis has been proved to be one of the most beneficial agents in correcting deformities, and in reconstructing parts for the development and maintenance of function, Rugh states that there are two aids which may never be lost sight of in the quest for success. These two aids are proper and efficient mechanical support until sufficient power has developed to take care of the condition and developmental exercises and training to improve and increase the power which may remain in any of the muscle structures. Coördinate and coöperative efforts are absolutely essential to this work.

Scheers, N. A. ACUTE ASCENDING PARALYSIS. [Nederlandsch Tijdschr. voor Geneeskunde, December 10, 1921, LXV, 2913.]

This was an unusually rapid fatal case of Landry's paralysis: death occurred within 48 hours of the onset of the paralysis. A robust,

healthy male, twenty-one, felt for four days tired and dull, with back-ache. On August 31 took to bed: great exacerbation of pain that night. The doctor found him restless, writhing with pain, and sweating freely. T. 38°. Pain in left lumbar region: great hyperesthesia of abdominal wall: no spinal tenderness. Perfect freedom of back muscles. Next day still violent pain; greatly increased reflexes. No motor disturbance. On September 2, pain much less, less restless, but very tired, with anorexia: T. 38°. Retention of urine. Raises himself with difficulty. Still hyper-reflexia, especially on left. Head movement feeble. Pupils large, unequal, normal reactions. Loss of abdominal reflexes: feeble left K. J. Left lower limb paretic. No sensory changes. A few hours later, increase of the left lower limb paresis: right leg possibly slightly paretic. No Kernig. Very slight sensory defect: occasionally mistakes point of pin for its head. Next morning, increase of paralysis (legs, trunk, arms). No pain: is conscious: no heart or respiratory involvement. Urine, much albumin and cylindrical casts. A few hours later, bulbar signs, and death in evening by paralysis of heart and respiration. Scheers thinks the paralysis was due to acute myelitis: against polyneuritis was the intact sensibility. The disappearance of the abdominal reflexes and the knee-jerks—which occurs likewise in polyneuritis—was presumably due to interruption of the reflex path in the grey matter of the ventral horns. The paralysis of the bladder, with retention of urine—not a usual sign—was presumably due to a destruction of the spinal reflex center itself. As to the infective agent present here, this is unknown. But, a few days after the patient's death, his mother, who had been in constant attendance on him during his illness, had a left-sided pyelitis with cystitis. Fatal cases of Landry's paralysis usually have a course of eight to fourteen days. [Leonard J. Kidd, London, England.]

Peabody, F. W. HARVARD INFANTILE PARALYSIS COMMISSION. [Bost. Med. and Surg. Jour., August 1921, CLXXXV, No. 6.]

This exhaustive report can only be touched upon here and there. The therapeutic results reported since 1916 left the Commission unconvinced as to the value of any method of treatment thus far suggested, they decided, therefore, in 1920 that they would not discuss the question of specific treatment in the acute stage. The services of the Commission were offered for diagnostic purposes. This gave an opportunity for the collection of data especially with reference to the course of the disease and the frequency of the paralytic phenomena. Thirteen cases in which the clinical picture, the pleocytosis, and the subsequent history of the case, justify the diagnosis of acute poliomyelitis in the preparalytic stage. Only four, or 31 per cent, became definitely paralyzed, while nine, or 69 per cent, did not develop any paralysis. The incidence of paralysis in acute poliomyelitis varies in different epidemics, at different periods in the same epidemic, and among different groups or ages. Fifty-one cases were treated in the preparalytic stage by intravenous

injection of the serum of patients who had recovered from the disease, and thirty-five, or 69 per cent, recovered without paralysis. Inasmuch as about 65 per cent of patients infected by poliomyelitis never develop paralysis even if untreated, the results of these small series of cases cannot carry much weight.

Kraus, R. PARALYSIS IN ANTIRABIES TREATMENT. [Revista del Instituto Bacteriologico, March 1921, II, No. 6.]

This is a clinical report of a case of paralytic myelitis in a man of sixty-two developed after Pasteur treatment following bite from a rabid dog. Treatment was begun two days after the bite. The paralysis developed about the thirteenth day of the treatment. The author goes over all of the statistics, tabulates the data from the institutes at Lille, Madrid and Rome, and elsewhere where no instance of paralysis has been known, and contrasts these with twenty-six institutes where there have been from one to thirteen cases, with a total of nineteen deaths. Children do not seem to develop the paralysis.

Gaenslen, Fred J. SLING SUSPENSION METHOD OF EXERCISE IN INFANTILE PARALYSIS. [Surg., Gynec. and Obstet., March 1921.]

A method of exercising the paretic muscles of poliomyelitis patients is here described. It consists in suspending the extremities which are to be exercised in a sling in mid-air, so as to eliminate the effects of gravity and friction. The method is more suitable for those cases in which there is a little movement. There are a number of illustrations, showing the application of the method to various movements. Flexion and extension of the hip can be performed with the patient lying on the opposite side, the knee splinted to prevent it flexing and the ankle suspended in a sling. For adduction and abduction at the hip the patient lies in the recumbent position and both ankles are supported in slings. Attention is called to the danger of exercise fatigue and to the necessity for limiting movement so that groups of muscles may not be over-stretched.

Dubs, J. POLIOMYELITIS SUGGESTING ACUTE APPENDICITIS. [Revue Méd. de la Suisse Rom., February 1921.]

This is one of a number of recent reports in which the symptoms of acute appendicitis were early signs of an attack of epidemic poliomyelitis. Three cases are here recorded, one in a young woman and two boys. The author mentions some of the other cases. Oehmig has reported a similar set of symptoms in a case which later was demonstrated to be epidemic encephalitis. The peculiar symptoms were leukopenia, hyperesthesia in various parts of the body, sweating and headache. These the author says are rarely seen in appendicitis and when present suggest great caution.

Marinesco, G. ENCEPHALOMYELITIS OF MALARIAL ORIGIN. [*Annales de Médecine*, January 1921.]

In this clinical case there was a myoclonus which involved most of the muscles of the trunk, abdomen and extremities in a young woman who died twenty-five days after the first symptoms suggestive of epidemic encephalitis. The malarial parasite was found in the blood and necropsy showed the parasites located exclusively in the nerve centers in foci causing an encephalitis.

Gareizo, A. ACUTE POLIOENCEPHALOMYELITIS. [*Archivos Latino-Amer. de Pediatria*, March-April 1921, XV, No. 2]

The child of six presented symptoms of both poliomyelitis and cerebral spastic hemiplegia, and Gareizo discusses how these two syndromes came to be superposed.

Saethre, H. TREATMENT OF POLIOMYELITIS. [*Norsk. Mag. Laegevi.*, February 1921. J. A. M. A.]

Saethre emphasizes the importance of warding off deformity from the very first of the disease. He shows by some instances that the backward curve at the knee, saber leg, is the result of neglect of proper precautions. Neglect of or faulty treatment he declares is responsible for nearly as much permanent functional loss after poliomyelitis as is the actual destruction of the cells of the anterior horns. Several illustrations are given showing improvised apparatus which will ward off the grave danger of allowing the muscles to be overstretched. These measures he advocates can be applied in the home with simple improvised appliances especially those to keep the feet at a right angle and the knees in the proper position. At first all the muscles must be kept in a completely relaxed condition, a passive repose. Not until all pains and hyperesthesia and Kernig's sign have disappeared should any exercise be undertaken, supplemented by massage and electric treatment. A tendency to abnormal attitudes must be counteracted with artificial means, celluloid and flannel bandages, plaster, etc. These artificial aids must be regarded as only provisional but he adds that the best functional results are obtained in the hands of specialists as in the neurologic ward at the Riks-hospital of which he is assistant. He describes his experience and the lessons therefrom, stressing in conclusion anew the importance of preventing any overstretching of muscles.

Hannah, L. POLIOMYELITIS OF UNUSUAL TYPE. [*Med. Record*, August 1921, C, No. 9.]

In this clinical case there was an absence of fever, pain, headache, or convulsions. The positive signs were of a hemiplegic type of paralysis, with involvement of the seventh nerve.

BOOK REVIEWS

Hazen, Henry H. DISEASES OF THE SKIN. Second Edition.
[C. V. Mosby Company, St. Louis, Mo.]

This is an excellent descriptive manual of skin diseases; one of the most precise and clear available. It is from this viewpoint highly recommendable. It represents, however, in Zarathrustra's penetrating language, a "reverse cripple." It is all about the skin—as it should be—but nothing about the skin of a human being. What the real meaning of the skin is as a part of the "body as a whole" there is hardly the slightest inkling. How the skin handles the innumerable forces that play upon it; what it does in the way of transforming these forces, the author does not even suggest. Nor, as a matter of fact, does any book on skin diseases. They are all "reverse cripples"; too much about one thing and nothing about the rest of the body of which it is only a part. What is really wanted some day is a dermatology that sees the skin in its relation to the entire body and its functioning. Until such a philosophical conception be gained all of our special treatises will hardly be more than mere catalogs of appearances; excellent things for the market place, but thin food for creative imagination.

Oppenheim, H. LEHRBUCH DER NERVENKRANKHEITEN. Erster Band. Siebente Auflage. [S. Karger, Berlin.]

This classical work, the first volume of a seventh edition which now appears after the author's death, promises to continue its great service to neurological science. Cassirer, Goldstein, Nonne and Pfeiffer have reëdited it under the general direction of Cassirer upon whom Oppenheim's mantle may be said to have fallen. Oppenheim died in May, 1919. He had been sick for some time, and the stress of war neurological service had prevented him from reëditing his last edition. A large gap with an immense amount of new material had to be filled if the book was to reëstablish its reputation as a monument of modern neurology. It was as a fitting mark of respect for the memory of the deceased master that the editors decided to keep the Lehrbuch alive. They have, therefore, preserved its general form and scope but have incorporated much of the accumulated material of the past ten years. They thus have kept it abreast of the times, so far as descriptive neurology is concerned. Here and there may be found the beginnings of the newer dynamic concepts concerning the pathology of nervous functioning, but on the whole the new edition sticks to the sound conservative method of the accumulation of data. It rarely infuses these data with a meaning.

Tredgold, A. F. MENTAL DEFICIENCY (AMENTIA). Fourth Edition. [William Wood and Company, New York. \$6.00.]

Tredgold's treatise on mental deficiency has been one of the standard descriptive manuals for 15 years. Above all it has been informative. Conscientiously conceived and carried out it is an excellent work. It is a little stodgy, British one might almost say, overformal, too schematic, narrow in its conceptions and formulations, but most sincere and the product of painstaking inquiry.

Whereas we admire its clinical delineations and its practical aspects, we feel annoyed at the attempts to make a "group" of such diverse material, and give it a "pathology." This mode of approach as an exclusive model to the whole subject of anomalies of intelligence and behavior should be a relic of the past. Tredgold's "Amentia" is a pure artefact. The conception belongs to that lost period of psychiatry during which one spoke of primary and secondary "dementia," and gave it a "pathology." Such a concept would bracket a terminal paresis, a terminal epileptic with a brain tumor, and a terminal dementia precox under the same term "dementia," and give it a "pathology." There is still too much of this type of "logical" (?) thinking in all fields of medicine.

Southard, E. E., and Jarrett, Mary C. THE KINGDOM OF EVILS. [The Macmillan Company, New York.]

In a recent stimulating and fascinating volume entitled "Duality" R. W. Bradley of London has sought to show that a certain fundamental struggle between racial types has persisted in human history since the beginning of all time. Anthropologically defined, "round heads" and "long heads" serve as the ambivalent models of this dualistic attitude towards the problems of life. The "round heads" were Asiatic. They envisaged life in its formal attitude. They made the Roman legal classifications; the Prussian efficiency. Intellectualism, logic, mathematics, philosophy, were the instruments chiefly utilized in their attack upon reality.

The "long heads" were African; Mediterranean. The Hellenistic culture, sensory impressionisms, artistic striving, intuitional and instinctive relationships with reality were their special attributes. In Freudian terms, this duality envisages the instincts of self-preservation and race propagation. Hunger and love were Schiller's terms for this antithesis, and Schiller himself recognized that he belonged to the former while he placed Goethe as the protagonist of the latter class. Bradley states that all the wars of moment in history were the expression of this essential duality of man's biological inheritance.

The "Kingdom of Evils" as a title for this interesting volume came from Southard's intrinsic creative unconscious. "Whom the gods love, die young" was his personal fate. His influence, however, is one that never dies, and the record of an effort to be of service to society, here presented, is one of the monuments he has left behind him.

To come to a prosaic account of what this book contains would

be a descent from the sublime to the matter of fact—nothing that Southard ever did could be called ridiculous—which in the language of the metaphor would be necessary to our quotation.

It is a book filled with ideas, as Roscoe Pound, in his large outlook upon legal activities in their relation to social problems has stated in a part of this volume, "here is something to quarry in." Here can be found Southard's stimulus as a "long head" to the "round heads" of every day practical effort in the amelioration of the social misfits which come before the neuropsychiatrist for treatment, psychical, psychological, and social.

We know of no work of this kind. It is unique. If read with this projected conception it cannot fail to be of lasting value.

Multiple Sclerosis. ASSOCIATION FOR RESEARCH IN NERVOUS AND MENTAL DISEASES. Vol. II, 1921. [Paul B. Hoeber, New York. \$3.75.]

At the third annual meeting of this unique and valuable "Association," held in New York, Christmas week of 1922, the reviewer heard comments which indicated a lack of information regarding what this gathering of neuropsychiatrists were trying to do. As one agency to make good this defect may we here state that this "Association" was started in 1920, as a representative gathering of American scientists, imbued with the idea that a concerted attack upon single problems of neuropsychiatric interest might yield results of definite value that could not be accomplished by other agencies. Thus an "Association" was formed that had for its *ideal* the study of *one* problem only, rather than the usual and more widely utilized mechanism of a general meeting for the discussion of various problems. The inception of this ideal sprang from many sources, but it was focussed into activity by a group of New York research workers, here emphasized under the names of an Editorial Board, Charles L. Dana, Smith Ely Jelliffe, Henry Alsop Riley, Frederick Tilney, Walter Timme. Last but not least Dr. Walter Timme was chosen as the president of the "Association."

At its first meeting in New York it was demonstrated that the *idea* was sound. A large assemblage gathered and a fruitful collection of studies was presented. These have already been recorded as Vol. I, Acute Epidemic Encephalitis, which problem was uppermost in interest at the time.

The present volume records the studies offered at the second annual meeting, which was also largely attended. A third meeting of even more enthusiastic participation discussed the larger and more complicated problem of "Epilepsy and the Convulsive States," while a fourth meeting for 1923 contemplates the outlining of a still more fundamental series of conceptions on "Heredity," as a constitutional background for the foundations of an understanding of many anomalies of structure and function as expressions of nervous and mental disease. Thus this "Association" has moved rapidly from the consideration of acute problems of imminent interest

to formulations of basic principles in the review of which the outlines of the field of neuropsychiatry are envisaged.

The present volume under discussion reveals the catholicity of the program offered by the authors of the plan. Almost every phase of the problem of "Multiple Sclerosis" has a representation. It has been a cardinal principle of this "Association" that *sincere effort at understanding* should be encouraged. No matter what conception might be offered it should be backed up by "experience." Whether it agreed with preconceptions was not the criterion; "honesty of observation" was all that was required. Thus the record ranges from extremes of structural and static presentations of the histopathological findings, recorded by Hassin of Chicago, Spiller of Philadelphia, Taylor of Boston, Leiner of New York, to the possible participation of emotional factors in certain types of the disorder by Jelliffe of New York. Ecological considerations are offered by Davenport, Dana and Bailey, from war records. Symptomatology is richly presented by Sachs of New York, Cadwallader and McConnell of Philadelphia, Sanger Brown and Davis (mental) of New York, Friesner of New York, Holden of New York, Ayer of Boston, Kennedy of New York. Barker of Baltimore says that no single etiological factor throws any light on the problem; in fact polyetiological concepts must reign and that multiple sclerosis is solely a syndrome, which may advantageously be regarded, as Müller has already advocated, as being a response to many factors. Syphilis has been emphasized by many; experimental spirochaetosis by a few, Kuhn and Steiner, Gye, and others. These findings were not corroborated by the researches presented by American workers, Teague of New York.

Thus this volume leaves us with much positive information concerning the clinical findings, but much up in the air relative to definite etiological factors. Secondary multiple sclerosis as a syndrome due to many factors is established. Encephalitis may produce the clinical picture; syphilis also, and many other things. A primary multiple sclerosis still remains unsolved. It seems to be a definite entity, as Hassin's presentation demonstrates. Whether such may have subtle unconscious factors behind it, as Jelliffe suggests, on the basis of psychoanalytic investigations still remains a matter of future research. Jelliffe certainly was unable to prove his contention, but in view of the paucity of material from the psychological point of view the question of primary multiple sclerosis remains an open question.

Biedl, Artur. INNERE SEKRETION. [Vierte Auflage. Band. I. 1 Teil. Urban u. Schwarzenberg, Berlin, Vienna.]

Biedl's encyclopedic work on the Internal Secretions has been a classic for a number of years. This new edition, the first part of the first volume, 338 large octavo pages, is an entirely revised and reëdited one. It is completely up to date. This portion contains the historical introduction, the definition and delimitations of the conception of the internal secretions, the subdivisions, the constitutional

conception, the mode of activity of the hormones and modes of investigation. This makes up 128 pages of the *general* considerations. Special endocrinology is then taken up. Here are collected the present day findings concerning the Thyreo-parathyreo-thymic System (Branchiogenic organs). This section takes up the entire remaining portion of the volume.

Its completeness forbids any real review. It is a review in itself, the most detailed, comprehensive and authoritative in any language.

Biedl, Artur. INNER SEKRETION. [Vierte Auflage. III. Band. Literatur. Urban und Schwarzenberg, Berlin u. Wien.]

This volume of 480 pages is solely devoted to the literature of the internal secretions. It is all bibliography. It appals one that so much has been written and makes one very humble as to one's own command of the literature of this comparatively young scion of scientific research. The reviewer notes about 20 per cent of his own contributions to the subject. If others are thus represented the book would have been 2000 pages, with some 40,000 references.

Bousfield, Paul. THE OMNIPOTENT SELF. [E. P. Dutton & Company, New York.]

A small book but with much of importance therein. It can be read in a half hour. From its reading one may possibly learn how much in love with ourselves we all are. Few will believe it but self-satisfaction is difficult, even impossible, to appreciate. The "Harvard" graduate may think it is nonsense; likewise the average Englishman, and certainly all the Babbitts of America. To those who are not afraid of a dose of cold water upon his conceit the book is to be recommended. To the self-satisfied we recommend the financial sheet of the New York *Times*.

Loewy, Max. DEMENTIA PRAECOX, INTERMEDIÄRE PSYCHISCHE SCHICHT UND KLEINHIRN BASALGANGLIEN STIRNHIRN SYSTEME. [S. Karger, Berlin.]

Just how the author conciliates the two tendencies of his former chief Kleist of Frankfurt and his later superior Pötzl of Prague, is difficult to conceive. Kleist, as a static Wernicke adherent of cerebellar-frontal-pathway disturbance interpretation tendencies, and Pötzl, as a Freudian functional advocate, represent the antitheses of present day attitudes towards many problems of neuropsychiatric interest.

We can only imagine that Pötzl, because of his recent transference to the Prague clinic has not really looked into the matter of this presentation. For Loewy emphasizes the structural disturbance of the cerebellum-basal ganglia-frontal lobe system as the causative factor in the phenomena, which, clinically considered, would be classified as dementia precox. This is plainly due to the influence of Kleist. It is not without a certain amount of gratification that the dynamic attitude sees the author in difficulties in his interpretation.

The whole point is raised by this not unimportant contribution whether structure determines functions, or function determines structure. Kleist as a protagonist of the former attitude is in conflict with Pötzl as an advocate of the latter. There is little doubt in the mind of everyone that pathways are necessary for function, but the static thinker always is inclined to think that anatomy precedes physiology, whereas the functional thinker knows that effort and desire gradually are crystallized into structure. The *wish* determines the pathway, as Kappers has experimentally and phyletically proved in his laws of neurobiotaxis, and thus Loewy's study, by his own tacit recognition of defeat in interpretation, shows the inadequacy of the structural attitude of approach as ambivalently opposed to the functional conception. No fair minded thinker denies, from the recent observations on epidemic encephalitis, that a definite pathway obstruction can give rise to a syndrome recognizable as related in a general sense to schizophrenia, but such an observer is not blind to the fact that a clinical picture must in a sense be dependent upon anatomical substrata, but that such an interpretation is but a part of the general situation. Vogt in his "Heidelberg" dissertation has called attention to the possibilities of basal ganglia disturbance as the anatomical substratum of hysterical phenomena, but even he, as the foremost representative of a conciliatory attitude between the ambivalent anatomical and physiological attitudes does not come to a definite conclusion. We therefore conclude that the present study, notwithstanding its structural predilections has not proven its point.

Weichbrodt, R. DER SELBSTWORD. [S. Karger, Berlin.]

In this 44 page study the author presents a sketchy, historical résumé of earlier works, then presents some heavy statistical pages. The general psychopathological situation is hardly touched upon. The work will be of interest chiefly to statisticians.

Henschen, Salomon, Eberhard. KLINISCHE UND ANATOMISCHE BEITRÄGE ZUR PATHOLOGIE DES GEHIRNS. Siebenter Teil. Ueber motorische Aphasie und Agraphie. Mit 17 Tafeln. [Stockholm. Privately Printed.]

With this seventh magnificent quarto of 319 pages and 17 full plate tables this noted Swedish investigator brings to a close his celebrated series of researches on aphasia and related psychical disturbances. In spite of severe illness Henschen has completed a work, the intensity and extensiveness of which, both alike speak as a lasting monument to his painstaking fidelity to the facts and his herculean efforts in gathering and arraying them. Neurological science is vastly indebted to Henschen's labors and he is to be congratulated on this the crowning achievement of a long and fruitful career.

In his last three volumes, V, VI, VII, Henschen has set forth the solution of the Aphasia problem on the basis of sectional cases

and the analysis of the mass of statistical material. In vols. V, VI, some 700 case histories are presented in abstract form; the present volume first takes up the continuation of this collected material until 1337 case histories are recorded. The remaining two-thirds of the book deals with the critical analysis of this material.

Historical features are discussed chiefly from the standpoint of the past twenty years, Marié and Moutier's thesis serving mainly as the pivot around which the historical discussion revolves.

In his critical discussion of theories, doctrines, and hypotheses the opinions of Storch, Freud, Goldstein, Lichtheim, Wernicke, Niessl v. Mayendorf, Marié, Dejerine, Heilbronner, v. Monakow, Jackson and Head, Jendrassik, Bianchi, Mingazzini and Liepmann are very sharply and concisely presented. He discusses the enormous difficulties and narrows down his criticisms to the more recent workers whose utilizations of serial sections alone entitles them to be seriously considered. Wernicke in general presented too schematic a portrayal of the situation. Niessl v. Mayendorf, Kleist and his pupils kept themselves enmeshed in purely speculative schemes. Von Monakow he finds unsatisfactory chiefly because of the constant hovering of his guardian angel "diaschisis". Marié's teachings he considers "keinen Fortschritt, eher offenbar einen Rückschritt." Head's new recent psychological departure, because it presents no anatomical clinical evidence, cannot be reasonably discussed. The Italian leaders Bianchi and Mingazzini are nearer to his liking. Henschen sees the various doctrines in a state of chaos. Out of these he would try to lead us. We cannot follow him further in this review much as we would like to. The pathway is too long and intricate. We can but say that no more interesting guide could be found than that revealed in this volume.

Claude, Henri. MALADIES DU SYSTÈME NERVEUX. Vol. II. [J. B. Baillière et Fils. Paris.]

This compact volume of the Gilbert and Fournier's series, the Bibliothèque du Doctorat en Médecine, comports to an eminent degree with the ideals set forth for this collection. The editors originally devised the series, which consists of 37 volumes, to represent a body of medical facts directly applicable to the work of the medical students in the French universities. Two of the volumes are devoted to neurology and were written by Claude. The present contribution deals with the disorders of the spinal cord, the scleroses, the meninges, the plexuses, muscles, peripheral nerves, the neuroendocrinoses, neuroses and psychoneuroses.

Claude has had the coöperation of Lejonne, Lévy-Valensi, and Schaeffer in their preparation. It is a concise and precise volume of approximately 900 pages of distinct merit. The essentials are presented in an orderly fashion and we have nothing but praise concerning it.

Foersterling, W. UEBER DIE PARANOIDEN REAKTIONEN IN DER HAFT. [S. Karger, Berlin.]

From the standpoint of purely empirical psychiatry this small monograph of approximately 100 pages will be of interest solely to those whose work is limited to prison phenomena. Its general features have been introduced to American workers through the translation of Nitsche and Wilmann's "History of the Prison Psychoses."¹ Whereas a rich development of this type of paranoid developments may be studied in prisons and in our mental hospitals, their infinitely greater number of milder and more camouflaged forms are to be observed in the bodily politic as isolated expressions of essential revolt against authority of all types.

In this sense, the reading of this monograph should be of far greater value than its more strictly limited discussion to the paranoid reactions observed in prisons would indicate.

All human beings, *i.e.*, those who have not entirely succumbed to the banal conventions of life, feel they are subject to some sort of restriction. They revolt at Prohibition, at Federal Taxation, at "Marriage." They resent supervision and control, and in one way or other, physiological or pathological, express their revolt behind social, mental or physical symbols. To adequately evaluate these radical, psychotic, or somatic expressions, a sincere study of the more flagrant paranoid expressions as elaborated in rich detail in this interesting thesis, will help to clear up many problems in the rôle of so-called "normal" phenomena.

In a recent (July, 1923) number of the *Psychoanalytic Review* an eminent jurist of the South has presented in a fascinating manner a "marital neurosis" as evidenced in his experience in 5000 divorce cases. He has entitled it "The Metamorphosis of Mary." He has presented the mechanisms which underlay the paranoid expressions shown in many unhappy married couples. It is veritable "Haft" or prison psychosis. Thus from the *extremes* may be read many valuable lessons concerning the *means*.

We recommend the reading of this fascinating monograph in the hope that its pregnant examples may be carried over to its more subtle expressions in everyday life.

¹ Nervous and Mental Disease Monograph Series, No. 13, translated by B. Glueck.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

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An American Journal of Neuropsychiatry, Founded in 1874

ORIGINAL ARTICLES

HYSTERICAL AMNESIA FOLLOWING PHYSICAL INJURY—A CASE STUDY *

BY CHARLES F. READ, M.D.

ILLINOIS STATE PSYCHOPATHIC INSTITUTE

THOSE INVOLVED

Harry Dawes: A somewhat neurotic young coal miner who writes well and has a taste for sculpture.

A Woman: Sultry, seductive and beautiful.

Another Woman: Also beautiful, but of a cooler, St. Cecilian type.

A Third Woman: A widowed and tuberculous sister.

A "Buddy" in the Marines: Son of a wealthy father.

THE FORCES AT WORK

(As suggested by those about Dawes)

1. The primitive urge of sex.
2. Sublimated desires—a love for the beautiful and a craving to express this in artistic creation.
3. Certain exacting conceptions of duty.
4. Poverty.

SCENES OF ACTION

(Roughly symbolic of the action itself)

1. Upon the Earth: School days when seventeen.
2. Above the Earth: Air service during the war.
3. Under the Earth: The coal mines of Orient.
4. Apart from Earth: In a state hospital.

* Read before the Chicago Neurological Society, January 18, 1923.

THE ACTION

1. A flight from the difficulties of eager adolescence.
2. A period of sublimation, too artificial to endure.
3. A period of conflict between desire for self-expression and a sense of duty resulting in self-immolation.
4. A second flight by way of retrograde amnesia.

The writer first saw Harry Dawes at the ——— State Hospital where he had been brought from a mining town hospital for the recovery of his memory. He had forgotten nearly a third of his life history and in consequence was distressed and distraught. He was a good looking well built young fellow of twenty-six whose only definite complaint was of an inability to recall any of the events of his life between January 7, 1914, and October 11, 1922.

On the former date he had had a quarrel with a friend, after which he "lost himself" on the way home during a storm. On the latter date he had come to himself in a hospital in a mining town in southern Indiana. This was practically his entire story save for complaints of some bewilderment and discomfort consequent upon the loss of memory. He accepted the fact that he was now twenty-six years of age, whereas he was only seventeen or eighteen when he could last remember himself.

The superintendent of the neighboring state hospital had been called to see Dawes in a general hospital a few days after a mine accident in which he had been struck over the right shoulder blade by a falling piece of coal about the size of two fists. Fellow workmen who witnessed the accident said that Dawes did not become unconscious but went to work again, only to complain of dizziness, after which he began to act "silly" and was taken out of the mine to a local hospital where it was said he became "cloudy, confused and violent" for a few days. Later he was removed to a general hospital where he became quite tractable in conduct and where Dr. S——— saw him.

At the time of this examination Dawes told the doctor that it seemed to him as if he came directly from school to the hospital at W———, *although upon the morning of the day of the examination he had seemed faintly to realize that a period of years had intervened and had quite a distinct recollection of the Orient mine in which he had been working.* Again he spoke of "islands of past events" which faintly showed their outlines in the early morning before he became thoroughly awake. In a few days, however, these

impressions had faded and at the time of this first examination, aside from two or three vague disoriented, dream-like recollections, he had apparently lost the intervening years completely.

Physical examination at that time was quite negative; the examiner especially mentions the fact that there were no anesthetics, nor reflex disturbances. He was in good contact with his surroundings, well behaved and intelligent. There were no psychotic features whatever and the very proper diagnosis of a psychoneurosis was made, following which he was voluntarily committed to the state hospital where the writer saw him a few weeks after the accident.

One interesting fact should be added, that *those associated with him had noted for two or three weeks prior to the accident a change in his conduct which they could not describe.*

Evidently, then, although this amnesia followed close upon physical trauma, it was a hysterical mechanism merely set in motion by the shock of the accident. The manner of onset betrays this origin, and even had Dawes been hurt about the head—as he described the accident later on in hypnotic sleep—a resultant retrograde amnesia of eight years' duration would be a highly improbable physiological consequence; *i.e., the trouble was emotional rather than commotional.*

What, then, were the upsetting emotional factors at work during the school days of the fall and winter of 1913 and what was the conflict staged in the galleries of the mine prior to the accident? There was no time for delving into infantile and childhood experiences and no history of any consequence save that he had enlisted in the Marine Corps shortly after war was declared, had served as an airplane observer on the Florida coast, had written some pretty fair, though unpublished stuff and had worked in the coal mines for a year or two. *Nothing was said by his relatives about another brief period of amnesia in 1914 and thus contained within the boundaries of the present one.*

Dawes was intelligent, exceedingly apt at self-interpretation and anxious to be helped.

Simple inquiry readily produced the fact that he had left his friend in anger on that last rainy night at school because the latter had sharply reproved him for his liaison with the pretty young wife of a college instructor. Overtaken by a thunderstorm while crossing the campus on his way home, he took refuge in the empty studio where he worked during the day and to which he carried the key (he was not a regular student, but merely taking an art course). As he sat

here in a bay window of the unlighted room the brilliant flashes of lightning revealed with particular vividness a still-life study of a human skull and some bright beads, resting upon a background of black velvet.

And as the youngster sat there thinking of his offense (for he was a decent-minded fellow) and of the woman whose body he desired and of the other woman who appealed to less gross desires (both fellow pupils with him in this same room during the day) the eye sockets of the skull seemed to lose their dependence upon the lightning for illumination and to become phosphorescent, menacing, a symbol of the final windup of earth's petty vanities. The friend, it seemed, had suggested that the outraged husband, a Spaniard, might very possibly kill if he ever discovered the peccadilloes of his charming wife—and, too, there was the other woman, sweet, innocent and gifted, not so much a sweetheart as the embodiment of everything spiritually desirable. During some free association connected with this night in the room Dawes twice became absolutely blocked, unable to think of anything but her name.

In his own account he cleverly delineates the two women and their effect upon him as follows:

"My first day at the studio I met both of the two women who were to play such a large part in my life there and afterward. I was old for my age and fully developed, and my emotional and slightly gloomy nature left me more open to attack and probably caused me to magnify in my mind certain feelings and impressions. In the forenoon I met A., as I shall call her here. I was at once strongly attracted to her by a certain light vivaciousness and a richness of character that held me. I don't think that I considered her beautiful at first, though she undeniably was, for her's is the type of beauty that one sometimes has to become educated to, a beauty that grows upon one the more it is observed. She was a senior at that time and appeared to be probably a little past my own age, though I soon learned that she was five years or more older. That fact, I think, added to rather than detracted from her charm for me. She was slender and fragile, with rather too perfect features, perhaps, had they not been softened and vivified by a warmth of expression that saved them from appearing waxen or artificial as most perfect featured persons do. Her greatest charm for me lay in her variable moods; a little whimsical, perhaps; alternately gay and a little pensive, yet always gracious. I loved more than all else to watch her expressive eyes and listen to the sound of her voice, so much so

that I think it would have mattered little to me had she not been beautiful.

"In the afternoon of that same day I met the other woman, whom I shall call Z. The extremes of the two letters of the alphabet could not be more widely separated than the personalities of the two women, A. and Z. Of Z.'s remarkable beauty (possibly a little on the wane) I shall say little, save to remark that she had been a famous model, and several years before that she had won notoriety as the "perfect figure" and one of the most beautiful women in New York city. I was infatuated from the first, and she encouraged me by little coquetries that I was not slow in responding to. It was not until after I had known her for some time that I learned she was married, and then I was so completely engulfed that I did not care. My regard for A. had not changed or diminished, but it was such a passionless, abstract sort of devotion that it was not until afterward (until I was away from the hectic influence of Z.) that I realized that I loved her—had loved her from the first.

"There are two separate and entirely distinct types of love; and one can love both ways at the same time, though he cannot love two different persons in the same way. My love for A. is, and always has been, an ethereal thing, utterly devoid of passion or any instinct of sex; a love that asks nothing, desires nothing, other than the privilege to do homage. It has been to me as a clear, white light that has more than once drawn me back from the brink of the mire. While my infatuation (that is a more fitting word) for Z. was as completely opposite to that other feeling as it would be possible to conceive, and the reason that it so far outswayed the purer attachment, for the moment, is because the average man is by nature more carnal than spiritual; more primitive under his skin than he is civilized without.

"My feeling for A. has even been wont to suggest to me soft music, with candlelight and long shadows, a summer evening at twilight; that for Z. crashed upon my senses as the flare of red torches under a tropic night, with the beating of tom-toms and the rattle of wind through jungle palms. It was of the jungles, jungly; of the elements, elemental. Yet my mad passion for Z. is now little more than a lurid recollection; while the other remains a pure, steady flame that has never wavered or grown dim. My prayer is that I may continue to keep that ideal undefiled; that I shall never desecrate it by allowing a thought of desire to creep in.

"I realize that both of these feelings have been abnormal in their

extremes and that a tempering of the two is the thing to be desired in this life. Humans are made up of both the spiritual and the material; and if we are to adjust ourselves to everyday living—if we are to find contentment—our ideals and aspirations should constitute a nice blending of the two. Otherwise one might find himself a carnal incubus or a disembodied mentality. I do not know which would be the worse, to be ‘earth-bound or sky-bound.’”

Here, then, he sits in a room haunted with memories of two loves, this boy of seventeen, thunder and lightning outside and emotional turmoil within—and gazing upon the scene with sardonic amusement, the leering, luminous eye sockets of a death’s head festooned with a silly chaplet of shiny beads. A fine mess for a young fellow to be in whose two-fisted, hair-triggered father had finally been persuaded against his own better judgment to let the lad see if he could make an artist out of himself.

What to do then?

Obviously the most appropriate thing for a youngster in this plight to do is to get away from the intolerable situation, as we so like to call it, and return to familiar, homely things—in this case his own boarding house and room.

Accordingly he left the studio—he describes just how he did this—and started out across the campus beneath the trees with their branches crashing about in the wind of the storm. *Then something happened to his head.* He is quite sure of this.

Janet remarks that this is quite a common thing, a head sensation heralding the onset of amnesias of this type. Dawes thinks perhaps a falling branch struck him upon the head—anyhow the lights went out for him and he remembered nothing more until he awakened in the mine hospital to find his sister sitting beside him looking “greatly changed” from what she used to be when he left for school in 1913—*Since which time she had become tuberculous and had been supported in a sanitarium, thanks to Dawes’ wages as a coal miner.*

All attempts to obtain any account of the events of this lost period by surprise questions or by free association were fruitless in the brief time available (the writer could spend only four days at the hospital). With every appearance of downright honesty Dawes disclaimed all knowledge of airplanes and when asked suddenly when it was he went to work in the Orient (mine) he countered in a puzzled way by asking the examiner if he meant Japan or China.

At one time during this first interview after free association with his eyes closed, he awoke with a start and without recollection of

some of the things he had been saying. This self-induced hypnoidal state naturally suggested the possibility of recovering the lost memories during hypnotic sleep, an undertaking especially alluring in view of the brief time at our disposal, though the undesirable features of such treatment were appreciated.

The first attempt was only moderately successful although a sketchy account of some incidents related to his flight from school following the night in the studio were obtained before he awakened spontaneously.

On the evening of the same day he was put to sleep again with the suggestion that he was somewhere upon a height looking down upon a sea coast of sand and water (one of his dream-like residuals which with one or two others were vague and entirely unrelated to any definite location). It was also suggested that upon awakening he would be able to recall what he might tell the examiner.

He went to sleep quite readily and, when asked to tell what he saw, gave an artistic description of a low-lying coast with sand bars running out into iridescent water, etc., following which he went on to tell of how he and his companion had thrown down a newspaper upon the estate of an Englishman on one of the keys as they flew over in their plane. After this in response to questions he gave an account of the principal events of his life during the amnesic period.

When asked why he left school he replied promptly that he did not know and this question unfortunately was not pushed in view of all the other recollections that had to be obtained in a comparatively short time. As he described it, he came to himself a few days after he left school January, 1914, in the cottage of some people who sent him home.

It is of particular interest to the writer that there was this period of a few days, following his flight from school on the night of the experience in the studio, for which even in his hypnotic sleep he seemed unable to account.

Following his flight from college he was kept at home by his father for some months "for fear his mind was failing," after which he went to high school and in the spring of 1917 was about to teach school when he developed typhoid. By the time he had convalesced we were at war and in July he volunteered in the marines, was sent to the Great Lakes for instruction in machine-gun work and wireless, and from thence to Boston. Following this he was stationed throughout the war at Miami where he served as airplane observer, patrolling the Florida coast, and during this time fell in with many cultured

people who were naturally interested in their handsome, artistic young protector.

Obviously, no matter what the war meant to others, this period of air service and sympathetic companionship was a heavensent opportunity for sublimation so far as Dawes was concerned. Like D'Annunzio in Italy this earth-bound young poet found in an airplane the Pegasus of his dreams. Unfortunately, however, the situation was too artificial to endure and he finally descended to earth only to find that the experience made later adjustments more difficult.

When asked if he had a friend, or "buddy" in the service he mentioned a man by the name of H——— but could not give his address other than that his father had a summer home near Oregon.

He was discharged in March, 1919, worked for a time as sculptor's helper in Chicago, then went out to the wheat fields and thence to the coal-mining town where his widowed sister had been taken sick. She developed tuberculosis and he went to work in the mines since he seemed to be the only member of the family free to help her. At the same time he was writing a novel and after he had accumulated a little money he laid off in order to write, but the sister had to go to a sanitarium and so he went back to the mines after a short time, working by day and writing at night. It was a grueling battle this, betwixt inner urge and outward need but the novel was good enough to induce a writer friend in the East to send it to her own publishers who returned it for remodeling with encouraging comment. Then came the fall of coal, not a bad one, but enough to make him feel dizzy when he got up and attempted to go on with his work. He was not knocked unconscious. The next thing he remembered was waking up in the hospital.

At this point, or before this, the patient should have been wakened, for after relating very comfortably the incidents of his experience in the marine service he had begun to sweat and was evidently very uncomfortable while telling about his life at the mines.

When asked if his brother was at the hospital when he "came to" he answered yes and when asked about his sister he suddenly straightened in his chair, opened his eyes, stared about blankly, tried to get up, gnawed at his knuckles, etc., until it became necessary to put him to bed and to sleep again. Very possibly he was reliving the inner struggle he had gone through as a miner. Two uncles had been killed in the mines and two brothers injured. As he wrote later on, "I had a natural hatred for the coal mine (as a boy) and my father's prejudice, which he never failed to impress upon me,

increased that feeling of hatred into a complete aversion, as to a thing repulsive." In a clever paraphrase of Kipling's *Vampire* he writes:

"A fool there was and his life he spent
 (Even as you and I!)
 In a stinking hole that never was meant
 For a thing that God his image lent,
 But we go in the mine by our own consent
 And only a fool knows a fool's content.
 (Even as you and I!)"

In view of all this it is not hard to appreciate Dawes' difficulties as a miner, the rebellion of his creative self against the conditions imposed upon it by certain ideals of duty. It was a period of self-immolation, of absolute regression from the viewpoint of this other self and the protest finds voice in another verse.

"Oh the joy he lost and the hope he lost
 And the shining career he planned
 Were won by the man who stayed above,
 Who had brains and grit and the will to shove,
 And things we can't understand."

Though he had done his duty there is self-reproach here; after all, why was he not able to accomplish his career in spite of handicaps, why could he not have managed somehow to care for his sister and still stay above ground where "a shining career" was possible?

In a recent letter Dawes has disclaimed unhappiness in his mine life but says he did get very tired, working by day and writing at night; that this poem was not intended as a personal lament, etc.; and yet how are we to accept these protestations in the face of the above.

There seem to have been at this period no particular sex entanglements and no especial emotional disturbances on this account.

He slept all night following his recital and the following morning lay quietly in bed with his eyes open but apparently oblivious to his surroundings. In the afternoon he regained touch with his environment and greeted the writer with a smile but no attempt was made to talk with him until the following morning when with considerable questioning he recalled his lost years in a series of rather disjointed episodes in which visual memories of an artistic nature played a considerable part; *i.e.*, the clock on the stairs in Longfellow's home, firelight on the polished floor in a Boston studio where he met many

kindred spirits, an admiral in full dress uniform, pictures of pieces of machinery he had drawn in colored inks (at Harvard), etc.

An illuminating item concerns his friendship for young H——— whose wealthy father it developed had offered to take Dawes (following his discharge) to England with them, give him an education and send the two young men traveling about the continent, *upon one condition only, that Dawes cut himself entirely off from his people*. Consider what this offer meant to the young artist-writer and then ponder his answer.

"And why didn't you do this?" he was asked, to which he replied very simply "they were snobs and I told them to go to hell."

Piece by piece these fragments accumulated themselves into a history that agreed entirely with that of the hypnotic state save that he now knew why he left school but did not remember anything about the fall of coal, only that something had struck him and that he awoke in the hospital. Memories of the coal mining period were naturally more difficult to recall than those of the war period.

The writer has not seen him since this interview. He left the hospital in about two weeks and is now in Florida. His written account of his life up to the time of his first flight is interesting, and cleverly written. As a youngster he thought out stories behind the plough and tried to write them down but was discouraged in this by his father.

"I loved to plow," he writes, "because it required but little effort of the mind and I was thereby left free to soar—and I created enough ravishly beautiful maidens and handsome heroes to stock a wax work gallery, had they been materialized. I concocted plots and counter plots and many of them I put on paper at night after my chores were done."

His schooling was indifferent—much of his time was spent climbing about in the Ozarks in search of caves, the mystery of which fascinated him. He was restless and discontented, suffered from wanderlust, loved the woods and mountains and dogs and despised the vulgarity of his surroundings.

"I am," he writes, "not asserting that I was overly imbued with moral scruples, but there can be refinement even in immorality. I hated the dirty coal camp where I lived, and I had nothing in common with the people I was thrown among. As I grew older I gradually drew away from the mongrel and largely vicious element that I had been accustomed to associate with, and retained only two or three friends that I considered worthwhile. . . .

"I had a friend in my schoolmaster when I was in my eighth grade in the little run-down school where I attended. He was one of those social misfits, an esthete without the other qualities requisite to make it practical or admirable—a man with the soul of a genius and the capabilities of a slothful pedagogue, and was given to cheap vices. I liked him, yet was contemptuous of him. He was enthusiastic over my drawings and persuaded my father and me that I should go to the state university and study art. My father was not in a position to pay my way through such a school, but I had already made up my mind, so I took matters into my own hands and went."

Sexual experience came rather early and was apparently normal in character. His mother was devout and early sent him to Sunday School. "From her," he says, "I inherited certain weaknesses (not moral) that have prevented me from being the dominant, aggressive man that my father was. I received a bare resemblance of my father's splendid physique but my oldest brother got most of his courage and initiative."

Here we seem to glimpse the same complaint expressed in the verses from his poem *The Mine*. He is not somehow able to grasp his destiny firmly, rough-hew it by main force from the materials at hand. "A fool there was" is a refrain not selected by chance. He is sensitive, poetic, artistically creative. He has ethical courage and physical strength and nerve but with all this he senses the absence in his makeup of a certain robust fiber, lacking which he has at two important times in his life been a fool for retreating in place of pressing on to his goal.

REMARKS

Thus far the patient has made only a symptomatic recovery.

Psychoanalysis with consequent self-revelation and integration would have been desirable had there been time for extended study. Much might be accomplished even by the simple procedure of talking matters over with the patient.

The patient evidenced so marked a tendency to lapse spontaneously into a hypnoidal state that the temptation to utilize and emphasize this dissociation can readily be appreciated. Thom,¹ pressed for time, found it necessary to hypnotize some of his patients before "shell shock" amnesias could be removed.

The lost memories would doubtless have returned spontaneously in time, but when it is difficult to say. Dawes had already been urged

¹ *Am. Jr. Psych.*, Vol. LXXVI, p. 437.

to recollection by several members of the family. De Teyssieu² cites a case totally amnesic for three years who recovered upon seeing a familiar name in some files he was looking over.

Ambulatory automatism is of course out of the question so far as the present attack is concerned. The patient forgot eight years to save himself further suffering. The fact that his memory faded rather than went suddenly and altogether blank clearly reveals the emotional source. The coal-fall merely precipitated the reaction.

But why did this amnesia retrograde all the way back to the time just preceding the flight from college at seventeen and thus include the very pleasant years of army service? It would perhaps have been more intelligible had it included merely the disgusting and disheartening coal-mining period. Or, upon the other hand, is it to be explained as a purposeful return to the carefree days of youth?

R. Oppenheim³ cites the case of a young officer who returned to early childhood days. Too, as remarked above, the period of the air service was not one of normal sublimation any more than were other war activities and had no firm roots in the structure of Dawes' personal makeup.

Why the patient could not recall in the hypnotic state the memories of his flight from college is not quite clear. Possibly another attempt, had it been worth while, might have been more successful.

In conclusion, the fact that the potentialities of the situation remain unchanged is fully realized. Dawes if sorely tried may become amnesic again. The remedy lies in his gaining more insight into the problems of his personal makeup, and in his ability to establish himself by his own effort in a life work that will give proper vent to his need for self-expression along the lines of artistic creation, the only direction in which he can accomplish useful sublimation.

² *Ann. Medico. Psych.*, 10 S., Vol. XI-XII, p. 422.

³ *Prog. Med.*, Vol. XXXII, p. 189.

NEUROSYPHILIS IN PANAMA *

A RÉSUMÉ OF THE ADMISSIONS TO COROZAL HOSPITAL FOR
FIVE YEARS

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The Isthmus of Panama, because of its geographical location, became notable soon after the discovery of the western hemisphere as the shortest and easiest place to cross the continent from one ocean to the other. Since an early date people of various nationalities and races have visited this strip of land, either in search of riches or as travelers. Occasionally a few remained as settlers or tarried long enough to leave a trace of their existence in the form of offspring. The blending of these immigrants and travelers with the inhabitants have produced a nationality composed of a mixture of all races with a preponderance of colored West Indians who emigrated to the Isthmus in large numbers during the construction period of the Panama Canal. The Panaman of to-day signifies a nationality, and not a race. An individual belonging to this nationality may present some features characteristic of an Ethiopian, Indian or Caucasian with emotions and instincts depending upon the race from which he originated.

Corozal Hospital, which is under the supervision of the Chief Health Officer of the Canal Zone, is the only Hospital on the Isthmus devoted to the care of the insane. The colored West Indians comprise the largest number of the admissions although they do not outnumber the combined population of the Republic of Panama and the Canal Zone; the Panamans are next to the highest, while the white North Americans are third. The latter include the employees of the Panama Canal and their families and a garrison of United States soldiers and sailors.

A study of our records for a period of five consecutive years

* Read before the Medical Association of the Isthmian Canal Zone, on November 17, 1922.

reveals that 17.27 per cent of those admitted were suffering from syphilitic psychoses, which is a higher rate than in the United States. Statistics collected by Donaldson¹ of the United Public Health Service shows that 10.04 per cent of the admissions to the hospitals for the insane in the United States are due to syphilis. It has been estimated that from 30 to 50 per cent of the colored population of Panama have syphilis in some form, which no doubt accounts for the large amount of neurosyphilis. The high rate in this country may be attributed to immorality, and ignorance of the colored population of the pernicious effects of syphilis.

The following table based on the admissions to Corozal Hospital for five consecutive years, 1917 to 1921 inclusive, shows the distribution of neurosyphilis among the various races:

TABLE I

RACE	TOTAL ADMISSIONS				ADMISSIONS FOR NEUROSYPHILIS			
	SEX		Total	Percent- age of total admis- sions	SEX		Total	Percent- age of total admis- sions of race shown
	Male	Fe- male			Male	Fe- male		
West Indians (Colored).....	251	190	441	46.17	72	31	103	23.35
Panamans.....	145	117	262	27.43	26	6	32	12.21
North Americans	156	14	170	17.80	13	1	14	8.24
Chinese and other races....	69	13	82	8.60	14	2	16	19.51
Total.....	621	334	955	100.00	125	40	165	

A perusal of these figures shows that 23.35 per cent of the West Indians were suffering from syphilis of the central nervous system. The next highest rate, 19.51 per cent, was found among the Chinese and other races while the Panamans and North Americans each showed 12.21 and 8.24 per cent respectively. Our records also show that more West Indians are afflicted with psychoses of the infection exhaustion type than all the other races combined, which leads one to believe that they have a low resistance to infectious diseases. Pellagra is quite common among them, especially in the females.

Unfortunately the age of the patients when they contracted syphilis could not be ascertained as most of them did not know their

exact age, and no reliable information could be obtained as to the length of time which had elapsed between the initial infection and the onset of the mental disorder. In the majority of the cases there was a history of mental symptoms of a mild degree for several months or a history of previous attacks which had shortly subsided, showing that there had been a gradual involvement of the central nervous system. In a few of the cases, however, the psychosis was of sudden onset necessitating immediate confinement. The approximate age of the majority of the patients was between thirty and forty years. There were no cases of juvenile paresis admitted during the period covered by this report, although the hospital records show that one case, a West Indian female, was admitted prior to 1917.

More males than females were found to be affected with neurosyphilis. Among our cases 125 were males and 40 females. The following table shows the distribution of the parietic and nonparietic types as to race and sex:

TABLE II

GROUP	WEST INDIANS			PANAMANS			NORTH AMERICANS			OTHER RACES			Total
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	
Paretic	30	4	34	15	0	15	12	0	12	9	1	10	71
Nonparetic	37	28	65	12	6	18	4	1	5	6	0	6	94

From the above it will be seen that there were only five female paretics, four of whom were West Indians and one classified under "other races." There were only six female Panamans admitted for treatment of neurosyphilis; all of whom belonged to the nonparetic group.

Symptomatology. We had no opportunity of observing the early neurological manifestations in our cases as the disease had progressed to a stage where the mental symptoms predominated. The mental symptoms manifested by each of the races were somewhat different. The character of the psychotic symptoms of a race depend to a large extent upon their degree of civilization; the lower the scale of civilization the less elaborate their delusional system and symbolic expression. An individual afflicted with a psychosis retrogresses to the primitive level of his race; thus the negro who has not attained a

high degree of culture develops into a simple dementing type of paresis without grandiose delusions. Very few display hyperactivity. In the early stage they fall into a lethargic uninitiative state, deteriorating rapidly and remaining more or less apathetic until death. Suicidal tendencies were never encountered; no colored patients have attempted suicide for the past seven years. Grandiose delusions were seldom found among these patients. They may be somewhat elated in the early stage, but this soon subsides and they deteriorate rapidly. This lack of grandiosity probably accounts for the belief which was prevalent years ago that paresis was not found in the colored race. Those belonging to the nonparetic group were more active, displaying irritableness and other symptoms characteristic of cerebral syphilis in the white race, but they were not emotional.

The Panamans, on the other hand, were very emotional. The slightest emotional stimulus that would exert little or no influence on North Americans or West Indians affects them profoundly. During a psychosis their reaction to emotional stimuli is still more exaggerated, resulting in periods of weeping and wailing or outbursts of temper during which time they may exhibit homicidal tendencies. They also manifested a marked degree of stubbornness which made them a very disagreeable class.

Diagnosis. In view of the protean nature and frequency of syphilis we made it a point to exclude this disease as the direct cause of a psychosis in every patient before proceeding further in the field of diagnosis. In arriving at a diagnosis each patient was carefully studied from the neurologic standpoint and serologic findings. A lumbar puncture was performed on every patient with suspicious neurological symptoms, even if the Wassermann reaction of the blood was negative, as we have found that sometimes the cerebrospinal fluid was positive when the blood was negative. In most instances tests made on the fluid included a Wassermann reaction, cell count and a chemical analysis for the determination of globulin and the colloidal gold reaction, but in a few cases a cell count was not made. We consider the colloidal gold test of great importance, especially in differentiating between the paretic and nonparetic types. We have found this test to be more constant than the Wassermann reaction and a better criterion of the results of treatment.

It is essential to classify the syphilitic psychoses into the paretic and nonparetic types for prognosis and treatment. In our experience, as well as of others, cases of paresis are not amenable to treatment and have a poor prognosis while the nonparetics improve to

such an extent that a goodly number of them are able to resume their former social status.

In this country pellagra is sometimes found in syphilitics and may be confused with syphilis of the central nervous system. Fifty per cent of our cases of pellagra gave a positive Wassermann reaction with the blood but a negative cerebrospinal fluid. The chemical analyses of the fluids were practically identical with those found in cerebral syphilis. There was a moderate increase of cells, the protein content was increased and the colloidal gold test gave the same reaction. Pellagra, like cerebral syphilis, presents no characteristic psychosis. The mental picture is variable and pellagrins who do not show skin lesions or those in whom the gastrointestinal symptoms and skin lesions are of a mild character are particularly difficult to differentiate from cerebral syphilitic. The difficulty sometimes encountered in distinguishing between the two conditions is illustrated in the following case:

Case No. 3074 was a middleaged West Indian female admitted May 8, 1919, from Santo Tomas Hospital. The medical certificate stated that she had been admitted to the above named hospital on one previous occasion for the same mental condition. There were no signs of physical disease. She refused to talk or wear clothes. On admission to Corozal Hospital she was extremely resistive, refused to walk and was mute. Neurological examination revealed exaggerated patellar reflexes. The pupils were dilated and reacted sluggishly to light and distance. The Wassermann test of the blood was double plus; cerebrospinal fluid, negative; protein increased and colloidal gold 1234443210. She was given twelve doses of arsphenamine without any improvement. Three months after admission she developed a severe stomatitis followed by a dermatitis. She died after a residence here of six months. The diagnosis before death was cerebral syphilis associated with pellagra. A necropsy showed no gross lesions of the brain. The pathologist reported the cause of death as pellagra.

We have encountered several cases similar to the above and believe that syphilis may be a predisposing factor in some cases of pellagra. Clark² noted the striking association of pellagra with such diseases as syphilis, chronic alcoholism, arteriosclerosis, chronic pelvic inflammations and various types of chronic intestinal inflammations and suggested that pellagra might frequently be a sequel to these conditions.

Method of Treatment. The plan of treatment employed in our series of cases was the administration of arsphenamine or neoarsphenamine intravenously every six days and lumbar puncture

with drainage of the cerebrospinal fluid every six weeks. In addition to the above therapy, mercury and iodides were given orally to the point of tolerance, care being taken to avoid stomatitis. The withdrawal of the cerebrospinal fluid every six weeks was done with a view of stimulating production with the belief that the new fluid would contain a sufficient amount of arsenic to be spirocheticidal to some extent. Fluid withdrawn after each dose of arsphenamine, in our opinion, does not contain as large a quantity of arsenic as after the fifth or sixth dose besides producing more discomfort to the patient from the repeated lumbar punctures. We have had a chemical analysis made of the cerebrospinal fluid from patients under arsphenamine therapy at various times ranging from two to thirty days which always showed the presence of arsenic. In one case No. 324263, the chemist reported the presence of arsenic to the amount of one thousandth milligram per cubic centimeter of cerebrospinal fluid withdrawn 108 days after the thirty-fifth dose of arsphenamine. Several others have also reported finding arsenic in the cerebrospinal fluid after the administration of arsphenamine intravenously, which appears to be conclusive evidence that at least the surfaces of the brain and cord come into contact with arsenized fluid. The amount of arsphenamine required in each case varies. We have had cases in which the serologic findings became negative after the tenth or twelfth dose, but usually from twenty to forty or more doses are necessary to bring about negative findings. In cases where mental deterioration is far advanced, indicating that extensive destruction of the nervous tissue has already taken place, intensive treatment will only arrest the destructive processes. The patient will always show mental deterioration because nerve tissues when once destroyed cannot be regenerated. It is therefore important that vigorous treatment be instituted as soon as possible after the onset of the disease before the nervous tissues are seriously damaged.

Results of Treatment. Space does not permit us to make a thorough analytical report of the results obtained in each case. In considering the results of treatment by the above method, the fact should be borne in mind that in our series of cases the disease had progressed to the stage where the mental symptoms were so pronounced as to render the patient unmanageable in other hospitals or a public nuisance. Many of the patients had never been treated for syphilis and no attention given to the first mental symptoms. In every case the disease had progressed to the stage where the patients were violently insane. If the disease had been recognized earlier and

intensive treatment given, we have reason to believe that the greater number of them would not have become inmates of an institution for the insane. The only favorable results, of course, were obtained in the cases of the nonparetic type, yet it is doubtful whether permanent cures are ever accomplished in advanced cases of this disease. Negative serologic findings with a complete abatement of the mental and physical signs only signifies that the infection has been arrested, and is in our opinion, no proof against a recurrence of the disorder. Treatment of this type of syphilitic psychoses according to the plan previously mentioned brought about results which may be classed into three groups as follows:

Group No. I includes those cases in which treatment produced a gradual improvement in the serologic findings and clinical symptoms, both becoming negative at approximately the same time as illustrated in the following cases:

Case No. 235390 was a black male, twenty-eight years of age. He was admitted from Ancon Hospital in a rather confused state, disoriented and with a speech disturbance. He stated that about three months prior to his present trouble on his way from the bathroom after taking a bath he found he could not talk and his whole body felt queer and that he had felt badly ever since. His trouble continued to progress so that he had to go to the hospital for treatment. All the neurological findings were negative except defective speech. Wassermann of the blood and cerebrospinal fluid was double plus; butyric acid, single plus and colloidal gold 2234322100. This patient was placed under treatment and after a sojourn of nine months, during which time he received forty-two doses of arsphenamine, the spinal fluid and blood were negative, protein and ammonium sulphate, single plus; butyric acid negative; colloidal gold 0121111000. This patient was discharged as recovered.

Case No. 1977, a colored male about thirty-eight years of age, admitted to the hospital on account of auditory and visual hallucinations. He stated that he had been sick for about two weeks prior to admission suffering from forgetfulness and inability to carry on his work properly. Pupils were dilated and did not respond to light. Reflexes were exaggerated. Wassermann of the blood on admission was negative; however, it became positive after a provocative. Cerebrospinal fluid was negative on admission but became positive about two months after treatment; cell count was sixty-eight per cubic millimeter, protein content was slightly increased, and colloidal gold was 3445432100. After nineteen doses of arsphenamine the spinal fluid became negative as well as the cell count and other findings. He was discharged as recovered.

Case No. 213521, colored male, thirty-four years of age on admission. He was brought to the hospital in a very excited state

with his hands tied. He admitted auditory hallucinations to which he reacted and he remained in an excited and disturbed state for a period of about two weeks. Wassermann of the blood was double plus, but cerebrospinal fluid negative; colloidal gold 1123321000. After twenty-three doses of arsphenamine this patient's findings became negative and he was accordingly discharged as recovered.

Case No. 2031, colored male about thirty-eight years of age on admission. He complained of feeling badly but could not give any definite information of his disorder. Wassermann of the blood was double plus; cerebrospinal fluid, negative; protein content slightly increased and the colloidal gold 1234321000. He was given treatment consisting of twenty-three doses of arsphenamine and discharged as recovered. Prior to his discharge his blood and cerebrospinal fluid were negative and colloidal gold, 1122210000. His mental condition with the exception of slight deterioration showed nothing of importance. This patient has been corresponding regularly with the hospital and when last heard from was doing well.

Group No. II consists of cases in which the mental symptoms disappeared but without corresponding improvement in the laboratory findings. A few cases are summarized as examples of this class:

Case 1950, a colored female thirty-eight years of age, who had premonitory symptoms of headache for several months prior to admission to the hospital. She became suddenly excited while at home and developed delusions of persecution and ill defined auditory hallucinations. On admission she was disturbed and showed marked agitation as well as delusions of persecution. Her pupils were dilated and irregular. Pupillary reflexes were normal and reacted to the usual tests. Knee jerks were diminished. Wassermann of the blood was double plus; cerebrospinal fluid was under pressure, globulin single plus. Cell count 32, and colloidal gold 1233310000. After a sojourn in the hospital of ten months and receiving fourteen injections of arsphenamine intravenously she was discharged as recovered. The cerebrospinal fluid findings were negative but the blood remained positive. This patient, who was discharged three years ago, has been reported from time to time by her husband as doing well and has required no treatment since her discharge.

Case No. 2251, a colored male, about fifty years of age, was sent to the hospital by the police because he was disturbed and confused. The neurological examination was negative. He was extremely restless, confused and talked in a rambling manner. The Wassermann reaction with the blood and the cerebrospinal fluid was double plus. The tests for protein were triple plus and colloidal gold 123432100. Active treatment brought about a negative Wassermann of the blood and at one time a single plus in the cerebrospinal fluid, but no change was ever produced in the colloidal gold curve. In fact after receiving thirty-four doses of arsphenamine the Wassermann of the blood became negative but the fluid remained double plus and the colloidal

gold was 5554331000. The mental symptoms subsided a few months after admission. This patient was discharged into the custody of a responsible relative as improved.

Group No. III comprises cases in which the laboratory findings became negative but with little or no improvement in their mental condition. The following cases are summarized as illustrations:

Case No. 1817, a colored male of about thirty-eight years on admission. No conversation could be held with him as he would not reply to questions. There was facial asymmetry and considerable degree of exophthalmos of the right eye and ptosis of the right upper lid. The right pupil was larger than the left and reacted sluggishly to light. The right knee jerk was greatly exaggerated but the left appeared normal. He continued inaccessible about ten days, after which he became talkative, showing some degree of mental confusion. Wassermann reaction with the blood serum and cerebrospinal fluid was double plus. The colloidal gold was 1113221000. He was placed under treatment and although the laboratory findings have become negative, and the ptosis and exophthalmos disappeared, he has shown no improvement in his mental condition. Since his laboratory findings have become negative he has had two convulsive seizures. There is a slight aphasia present but no paralysis. He is still a patient in the hospital.

Case No. 226432, a Panaman male nineteen years of age, admitted with delusions of persecution and complaining of a severe headache. There was nothing important in the neurological findings. The Wassermann of the blood and cerebrospinal fluid was double plus and all other tests were indicative of cerebral syphilis. Colloidal gold was 1123210000. Patient was placed on active treatment and the Wassermann of the blood as well as the spinal fluid have become negative. Although his headache has disappeared and his delusions of persecution have somewhat subsided he manifests deterioration, is pugnacious, untidy in habits and remains in the hospital on the disturbed ward.

Case No. 22426, a colored female about forty years of age, admitted from Ancon Hospital suffering with auditory hallucinations of a persecutory character and also complaining of various somatic delusions. Pupils were slightly irregular but reacted to the usual tests. Other neurological findings were negative. Wassermann of the blood and spinal fluid was double plus and all other tests indicative of cerebral syphilis. This patient required as many as forty-one doses of arsphenamine before the laboratory findings became negative. She is still a patient in the hospital as mental symptoms are still present but not so marked. She also shows some degree of intellectual impairment.

The results, although not ideal, demonstrate the effectiveness of treatment of the nonparetic type of neurosyphilis. The method of

treatment previously mentioned brought about negative laboratory findings and a return to their normal mental status in 25 per cent of the cases of cerebrospinal syphilis; 25 per cent were discharged for deportation to their native countries before recovery was complete; 24 per cent died of some intercurrent disease during treatment; and the remainder, 26 per cent, are still in the hospital on account of their psychotic manifestations but their laboratory findings are negative, indicating that the disease has been arrested. Further improvement of the latter group is not anticipated on account of the marked intellectual impairment resulting from the irreparable damage to the nervous tissues.

A necropsy, which was performed on all who died except one, showed that gross pathological lesions of the brain are sometimes absent. In five of the cases there were no lesions of the brain observed, while six showed slight changes such as passive congestion, injection of vessels, etc.; two, marked general atrophy; three, small cavities or small areas of softening; and five showed marked changes in the meninges. In fifteen of the cases definite syphilitic lesions of the aorta existed, showing that some relation probably exists between specific aortitis and neurosyphilis. Some intercurrent disease was responsible for death in all the cases. Tuberculosis in some form was the cause of death in one-third of the cases.

A few of the cases of general paralysis were subjected to the same treatment as the nonparetics but the results were very disappointing. The following case illustrates the futility of treating general paralysis:

Case No. 238684 is a white male, age forty-one years. He was admitted June 11, 1921, with clinical signs typical of general paresis. The Wassermann test of the blood and cerebrospinal fluid was double plus. Cells per c.mm. 20. Chemical analysis showed ammonium sulphate and phenol tests, double plus, and colloidal gold 555554210. After receiving fifty-three doses of arsphenamine with drainage of the cerebrospinal fluid every six weeks, the Wassermann of the blood became negative but the fluid remained double plus, the ammonium sulphate and phenol tests became triple plus, and the colloidal gold 555555421. His general condition had gradually grown worse so that at the close of the treatment he was unable to walk without assistance, could not talk and had developed a paralysis of the left side of his face.

Treatment of general paralysis, in our experience, has never resulted in more than a temporary improvement and never exerted a

favorable influence on the prolongation of life. As an argument against treating paresis, the following cases are cited:

Case No. 206376, a black Jamaican male, forty-two years of age. He was transferred from Ancon Hospital August 29, 1918, with a diagnosis of general paralysis of the insane. Neurological examination showed stiff pupils, positive Romberg, defective speech, perioral tremors and spastic gait. Mentally he was so confused that he was unable to answer questions. The Wassermann of his blood was anti-complementary, cerebrospinal fluid double plus, butyric acid, ammonium sulphate and phenol tests, each triple plus, and colloidal gold 555555554. Shortly after his transfer to this hospital another lumbar puncture was performed which gave a positive Wassermann reaction of the fluid, fourteen cells per cubic millimeter and colloidal gold 5555555333.

Case No. 1968, a colored Barbadian male, twenty-nine years of age on admission September 19, 1918. The examination revealed anisocoria, stiff pupils, absence of deep reflexes and speech defect. Wassermann of the blood and cerebrospinal fluid was double plus; tests for protein double plus and colloidal gold 0555555331. He displayed increased psychomotor activity, a rambling stream of talk and emotivity.

Neither of the above cases was treated. They became accustomed to their environment and for the past three years have been engaged in light work. Recent laboratory findings of the blood and cerebrospinal fluid are typical of general paresis. These cases are perhaps unusual, but as yet we have seen no cases of paresis which have shown more than a temporary amelioration of symptoms from arsphenamine therapy with spinal drainage and we are inclined to believe that of the two spinal drainage is responsible for the slight temporary improvement. In some cases of advanced paresis we have seen the first dose of arsphenamine produce a marked reaction lasting several days during which there was an exaggeration of all the symptoms, an elevation of temperature and a skin eruption similar to that found in the secondary stage of syphilis. In such cases it appears that the organisms of syphilis react much the same way as other living organisms. If not disturbed they remained more or less dormant but if attacked by an enemy they do considerable damage before finally overpowered. It is doubtful whether the spirochetes which are embedded in the parenchyma of the brain with innumerable reserves are ever in danger of being annihilated, or even suffering heavy casualties with our present armamentarium.

CONCLUSIONS

1. Records show that 17.24 per cent of the admissions to Corozal Hospital for five consecutive years were suffering from neurosyphilis.
2. Neurosyphilis is more prevalent among the West Indian population of Panama.
3. Intravenous administration of arsphenamine or neoarsphenamine every six days with spinal drainage every six weeks resulted in negative laboratory findings and a return to their normal mental status in 25 per cent of the cases of neurosyphilis of the nonparetic type.
4. The treatment of general paresis, in our experience, is unsatisfactory; however, cases of neurosyphilis, in which the diagnosis of general paresis is doubtful, should be subjected to intensive treatment.

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TRANSLATIONS

EMOTION, MORALITY, AND BRAIN*

BY PROF. C. V. MONAKOW

ZÜRICH

(Continued from page 462)

The most wonderful thing in the structure and organization of the "emotions" in contrast to the "World of Sensation and Orientation" is the dependence (worked out to the finest point) of the ganglion system belonging to the former, on the condition of the whole cellular economy in the human body, and especially on the "good or bad functioning" of those organs representing the most vital and most immediate interests in life, that is, of respiration, circulation, nutrition, and the sexual organs.

For the physiological performances governing the arrangement, holding together, and finer distribution of the "interests," two more widely regulating apparatuses are necessary—beyond the visceral nervous system and its cortical representation:

(a) The system of the endocrine glands, with their secretions and ferments. They furnish trophic material not only to the visceral ganglia, but also to all the higher representatives of these, above all the "food" for the emotions in the cortex: bio-chemical component and

(b) The so-called exteroceptive or the orientation system serving the sense organs, differentiated as it is with extreme fineness: world of sensation, the Department of the External. This bestows on the crude structure of the emotions and instincts, the necessary differentiations according to individual experience and causality; and gives it historical organization, in conformity also with higher purposes, on the basis of "apperception" (Steinthal) and of speech. It supplies finally, the somatic foundations for the proper resolution of the innumerable personal interests and impulses, as well as of the emotional conflicts in the present and in the past. Through higher modes of functioning, the "World of Emotions," thus built up, is brought into greater power, which controls the primary impulses in the interests of higher biological values. Even the intellectual world itself is converted into a compliant instrument. It is indeed the world of

* Authorized translation by Gertrude Barnes, A.B., and Smith Ely Jelliffe, M.D., of the authors *Gefühl, Gesittung und Gehirn*.

instinct resting in the latent states, and reaching the threshold of consciousness only painfully and incompletely, which sets our activities in operation.

It is a phenomenon which is not less noteworthy, and one which is especially important for neurologists, that the results of the reciprocal activities of the apparatus in question (ganglion system, blood-glandular system, cortico-associative system), results which are registered and fixed from moment to moment in addition to the suitable "emotional censor," may not only be reilluminated (ekphoric) and brought to conscious remembrance in associative and other ways, but in their reproduction the affects produced in the first "experience," in addition to the bodily (visceral) phenomena accompanying them, are again manifest, to be sure, generally in diminished form: for instance, blushing on remembrance of a painful situation, erotic excitement upon allusion to a love scene once enacted, a flow of saliva on following a description of gustatory gratifications, and so forth, and also for instance the Pavlov experiment on conditioned reflexes in dogs, and so forth.

In the building up of emotionally colored memory images there is, however, a force effective even in the most minute bio-chemical processes in the body, influencing and bringing them to ekphorie. This latent sensitive moment maintains our perceptive faculties, that is, our instinctive life, constantly on the alert. It is a well known fact that in the innumerable emotional values stored up within us, through continued experience, and ever more delicately differentiated, those most powerful at the instant of conflict, advance together in vigorous concurrence, and can release the most various conflicts of all levels of emotion (from passion on up to morality) even to pathological exhibitions. The explanation of this will follow in the chapter on the pathology of the emotions.

RECAPITULATION OF THE FIRST TWO LECTURES

1. The most practical classification of the emotions is according to their historical or phylogenetic development, on up to homo sapiens and ontogenetic development. From this total development or history we learn that there persists first of all a blind impulse towards thriving and perfection, first of the individual, and then of the rest of the world, from which it arises, and indeed after the death of the individual, or as it may be, after the death of the cell. This pressure towards perfection is characterized by assurance against decay even of the coming generation, and may be at the cost of the individual

(self-sacrifice of mankind). This is the primary ethical emotion, which as a minimal trace or germ may dwell within the living protoplasm even of a single celled animal, and which presents to us the incomprehensible primary cause of all morphology of the nervous system and of the emotions, even to morality. This primary emotion has the purpose of caring for the most worthy, later of the most noble life interests, the values and precedences of which are determined by social life, that is, through education and culture.

2. The emotions may be divided into "somatic" and "psychic" (of course with transitions). The first are for the most part inborn, and belong to the immediate present (determined by immediate stimuli). The psychic are built up in a temporally complicated way (in part, a fusion of derivations from various developmental phases of life and of experience). At any rate, they constitute the results of experience through the mediation, and on the basis, of the "world of sensation." Their aim, as has already been observed, is not only individual growth but perfection in the broadest sense. The biological means to attain all ends are: first, respiration, the reception and acquisition of food, individual defense against hostile attacks, their guarantee of the future of the generation (selection and reproduction), collectively, and so forth, in brief moments which guarantee that the foundation from which man has sprung is firm and sure. The objects of the "vital interests" are: the individual, the race, the clan, but also the wider interests of the world closely connected with the true interests of the individual (the search for God). The values are altered during the individual developmental life (phases of life), and gravitate with increased individual experience, self-education and culture, ever towards the future, that is, towards the coming generation and at the cost of the individual. This comes to pass gradually and with variations; in the period of childhood, the selfish interests predominate (true egoism; primary basis), thereupon follow successive sacrifices of these interests, at least in part, in favor of the family, the kinsmen, the nation, and the ideal world interests (religion, humanitarian aims, altruism).

3. Out of the primary emotional values and fundamental aims (currents of the will) a multitude of special emotional values evolve to attain corresponding, related ends; the feeling of power, the sense of industry, acquisitiveness, the guarantee of existence of the family and the nation, even to care of the welfare of mankind, and at last the impulse towards union with God and the universe. Here there are a legion of special interests and values, which continually

lie in opposition to one another. In fulfilling the immense special tasks of life that change from situation to situation, there occurs consequently inner collisions and conflicts, struggles for precedence of the innumerable emotions in question: "What shall be sacrificed, and what interests sacrificed to what others?" In the majority of conflicts, the struggle means that the direct, conscious individual emotions (instincts; Schopenhauer designates even morality as a victory over the will to live) should give way to those controlling the growth of the family, of humanity, and so forth.

4. The finer individual structure of the emotions and of morality is dependent on the nature and content of the personal experience (derivations and results of this), on education and practice. Only the most vigorous and in general the best known differentiations of the emotional values can be brought to expression through customary speech and symbol, as definite social aims.

5. Since all emotions present a definite relation between "tension and release," that is, a certain phase of the struggle for precedence of definite emotional values ("bodily" and "spiritual," personal and altruistic interests), it follows the noblest emotion is built up on opposite, that is, on latent collisions between higher and inferior emotional streams. Thus is explained the fact that eventually baseness and nobility (with a slight surplus of the one or of the other) can dwell in the same breast, side by side, even if not in peace.

Since every free living cell in the world bears in itself a germ of "will" (rudimentary will), that is, of instinct, it follows that we may assume that every cell in the human organism has a share, even if most minute, in the total emotional life (individual cellular emotion, individual cellular mneme). Through the potent division of labor, which begins in the phylogenetic development in progressive manner, special organs are now created, especially a central nervous system (the visceral and the somatic with the frontal end). Therewith is inaugurated in rich measure the creation of "special faculties" as well for the sensations as for the emotions. Nevertheless these special faculties do not undertake to carry on all this work; there remains rather a certain minimum capacity to create emotions in the whole cellular state. The complicated forms of emotion and sensation built up on the basis of individual experience acquire meanwhile a further elaborated special apparatus (chronogenically localized) within the brain and especially the cortex, and the visceral glands are entrusted with the "feeding" even of the cortically represented "emotions," and indeed with the secretions supplied by these.

The world of the emotions takes the largest share in the phylogenetic and ontogenetic differentiations of the central nervous system; indeed it is the true, living cause thereof.

The physiological component of the emotions consequently seems to be on the one hand the product of the functioning glands, and on the other hand the product of the visceral and sensory cells and of their satellites, as well as of the fibrillar bands (molecular substance). Without doubt these glandular cells furnish the "chemical material" to the nerve cells continually, with a view to building up the emotions ("material" component), and this comes to pass, according to the combination of the stimulus phenomena in the central nervous system, in one of the forms or qualities which is conformable with the different biological aims (close reciprocity). Originally the "physiologico-chemical (primitive) material" for the production of emotion (in single and multicellular organism) must have been united in a single cell, just as it was for the rest of the nervous functions. With the beginning of a division of labor in the organism, arose meanwhile specific cellular forms and later apparatus even in the regions for sensibility, for every physiological, special activity and above all the Leydig cells made their appearance.

The influence on the nerve cells coming under consideration here, through "inner secretion" must be already quantitatively extremely diverse; it exhibits itself at one time in the immediate present (stadium of actuality; ferments or oxidation ferments?), at another time in periods of varying compass; latent, periodic, wave-like forms of stimuli. But even the finer chemical composition of the secretions may vary greatly in various ways according to the quality of the emotion (antagonistic secretions of the hypophysis, thyroids, and the adrenals?). In regard to the chemical structure of these secretions, we know to-day, to be sure, only that of adrenalin and thyroglobulin (Oswald). The cerebral nerve cells can excite the visceral nerve cells through mnemonic stimuli (ekphorie) to prompt action, whereby again other cerebral nerve cells can be excited retroactively and new emotions awakened (?)

Psychologically the emotion is considered as a conscious momentary result of manifold subjective stimuli in our body. It is something fused with the ideas, born subjectively in the immediate environment, in part (pain, hunger, and so forth) endowed with spatial characteristics, and always with a quality tone of the something, however, that orders and utilizes past and future according to causality.

Physiologically the emotion can be conceived of as a gripping subjective tension striving for discharge or satisfaction, with an endless number of layers and accompanying values laid upon one another, descending to the most various phases of life, and temporally overlapping one another. The emotion is dependent on life-chemism, and is provided with ascending if fluctuating tendency towards perfection, even to the generations of the most remote future. In the ascent of an emotion, the single values foreign to the aim that one strives for are inhibited; they are pressed into an indefinite latent state (suppressed and subjectively thrust out), and others chosen as "confederates" (allied emotions). Hereby the excesses of definite forms of emotion in the immediate present arise, representing the impelling motive of our activities. Through these perpetual phenomena, the world of sensation in the sense of a wise (or unwise) economy of life is further differentiated and built up (reason).

Questions of localization. To every cellular element and to every "emotional apparatus" collectively entering into function in the present moment, in the central nervous system as well as in the visceral organs, is assigned a special, individual, or collective rôle in the building up of the emotions. A spatially definitely circumscribed separation of this apparatus from that of the "world of sensation" is only possible within the primary "executive structures" (system of the visceral and sympathetic ganglia, area of functions in the spinal marrow and in the brain stem); *i.e.*, paths of conduction for pleasure and pain. The chief stations for the higher emotion (consciousness) is certainly in the cortex where, however, several distinct structures, that is, structures closely connected with the periphery, have a sharply outlined innervation area. An island-like cortical representation or a cortex representation can be ascribed to the emotions as little as to sensory perception.

A limited, "chronogenous" localization in the cortex can be assumed theoretically, nevertheless, for certain innate emotions in the following sense:

(a) In the form of an optimal innervation path from the periphery (emotions immediately liberated); these might coincide in part with the various innervation regions for the various bodily parts and sensory areas (the zones for the extremities, and so forth). The representations of the sympathetic and visceral nerves, nevertheless, might not be excluded from any cortex area of the brain upper surface.

(b) In the form of successive incidents and experiences, which

proceed parallel with the biological development and run parallel with the finer structure of the central nervous system, and live latent within us in the form of engrammes temporally built up in a complicated way and united through causality, and which are accessible for the ekphoric stimuli (that is, memory) of any time—no matter what place receives them in the order of their acquisition in time.

(c) The peripheral visceral and sympathetic nerves and ganglia within their "individual and collective mnemes" are indeed never wholly passive when the corresponding emotions become manifest or repeatedly manifest (central reproduction). At any rate, in my opinion, a biochemical (material) component, supplied through the secretion of the endocrine glands, even though only in minimal measure, is necessary for the production of emotion arising in the immediate present. The sphere of affective functioning of this component at the time can not be more definitely indicated.

III. PATHOLOGY OF THE EMOTIONS

The content of any instant that is experienced within us is composed of single emotions, which, on closer examination take the form of a kaleidoscope albeit to some extent systematized according to the biological emotional values. Such a content represents the result of an arrangement of the separate phenomena according to a scheme of their occurrence (phases of the past), and of their vital values, which are manifold and in part opposed to one another. We experience in the "splendid instant" (Goethe's "Faust") not only emotions created at the given moment but we experience also kindred feelings belonging to the retrospective past; and in doing so, experience the future emotionally. In other words, our feeling in the immediate present constitutes a profound and complicated movement to the soul; it represents a transition of the past into the future with all the "seasoning," and often the transition from tension to the desired discharge. These processes we now stamp with a favorable or unfavorable "common mark," ever in conformity with the constellation of the permanent factors in question. In conformity with the censorship with which we communicate our affective state, our mood is determined.

All possible phases ("temporal strata") and situations of the conflict among the vital interests, from indifference and Homeric psychic calm with excess of a positive emotion (equilibrium of the affect), on up to the most violent passion (assault of primitive interests) may fill the moment. The regulator and the most important weapon in this struggle representing the passing life of the soul are

furnished by ideas ("memory images" and their causal derivatives) and particularly by reason, the representative of the noblest human interests and at the same time the representative of the most distant future, in contrast to the instincts which protect the immediate life of the individual.

Innumerable currents of emotional forms, sometimes occurring simultaneously, strive in us for discharge, of which the larger numbers are unconscious, from hunger for air up to the most exalted moods; many are worn out in a short time, often in transit; many are "rewritten" or transformed (the colliding emotional currents playing one against the other unconsciously). For appreciation of the moment of conflict and the duration of the reaction (collision of the emotions) as well as for the critical examination of the relations between the inner and outer causes of the conflict (incidents, appetites) and the intensity of the conflict (agitation), we possess in daily experience a certain elastic measure that we designate as the norm. Where this norm is not overstepped in a striking manner, we conclude that the emotions are normal.

This norm can indeed be broken through and overstepped in various ways: the vigorous release of the emotion (affect) is always accompanied by somatic phenomena in the sphere of the sympathetic and visceral nervous systems, or of the inner secretions, and this latter again, if corrected by opposing stimuli, may supply us also with the most effective weapon for the control of outbursts of psychic disturbances. Here again without exception the interests in life considered most momentous to us at the moment and to which we wish to supply values or to protect from menace and injury create the object of the conflict. The aim is assurance of our individual life, and also that of our descendants, as well as of our beloved fellow creatures. We may designate an exaggeratedly long psychic response or a period one, recurring spontaneously, to an offense to our vital interests, above all if that reaction is characterized throughout for us by accompanying somatic phenomena (cortico-spinal and visceral) of annoying intensity, with manifold reciprocal effects, simply as nervousness or neurosis (often it is already a question of a psychoneurosis); and, too, if the subjective causality (that is, the subjective interpretation of the relation of cause and effect) lies wholly in the territory of the offended interests of the individual, and the offended subjective feeling of being injured becomes the point of departure for the whole judgment of the situation (egocentric condition). As is well known, every strong emotional impulse—in particular bodily pain—even in healthy persons, forces to a degree of

subjective causality. Such an emotion arouses not only the desire to understand its true location and duration within us, but makes us inquire into its true cause, and to reflect on the possibilities of its issue, and finally on the wider consequences for the future resulting from this affliction. If we discover a palpable cause of pain, and if we see a possibility of its speedy removal; then this result of our reflections allows us to illuminate the future with favorable light; we conceive hope for a speedy release and are quieted, even if at the same time the bodily pain continues with equal intensity. If this is not so, our psychic distress can continue unchanged even though the bodily pain for the moment is insignificant; indeed it can even reinforce the bodily pain. In the neurosis, the subjective causality (the imagined cause, often in the sense of unreasonableness) blocks up the path to a successful solution; sometimes, however, even in the neurosis, the insight temporarily erring, finds the right way, as soon as the subjective difficulties are to some extent done away with.

There is a psychosis when the individual is forced to assume a false position of defense toward the outer world because abnormal emotions with false relations persist, and because the false relations of the individual to the external world (which can extend even to total lack of critique), compels him to assume an attitude of defense; in other words a more or less quarrelsome opposition between the individual and the outer world. But, as is well known, the psychosis can also be characterized by the overactive, expansive inclination of the individual towards the outer world, in the sense of an aggressive tendency or impulse to make the outside world happy, to become master of it, and in the sense of an excessive inclination towards enterprise, towards activities of which the patient constitutes the central foci, and so on. But here they are always seeking protection of their own peculiar vital interests which, they believe, are imperiled, or protecting the interests of others; or they desire to attain their own high-strung wishes, or further their own interests or those of others, even to the extent of using force. All these changes in disposition are combined of course with the beginning of intellectual decay, disturbed orientation, with hallucinations and delusions, with many inhibitions or slackening and displacements of the relations between the world of sensation (experience) and the world of emotion—dementia precox—with an agitated and intensified condition of the will. The final stage consists in dissolution of function in the intellectual and emotional spheres, even to a fragmentation (confusion) and complete decay.

(To be continued)

SOCIETY PROCEEDINGS

NEW YORK NEUROLOGICAL SOCIETY

FOUR HUNDRED AND SIXTH REGULAR MEETING, OCTOBER 2, 1923

DR. E. G. ZABRISKIE, President, in the Chair

I. CASE OF DYSTONIA WITH ATHETOID FEATURES

Dr. Margaretten presented this patient who he said has a sequential history since birth which has a definite bearing on the etiology of her disease. Birth was normal from a tuberculous mother. Other family history negative. Two weeks after birth she had convulsions and developed a right hemiplegia. She cried almost incessantly for two years. Received a trauma to the head at two years and shortly after this her aunt, with whom she lived, noted peculiar movements in the right upper and lower extremities. A year ago the same type of movements developed in the left upper and lower extremities. Today she can not walk or sit up without assistance; she can not talk beyond a few monosyllabic words; bowels, urination, sleep, appetite normal.

Physical examination: A poorly nourished child, with apparent dystonic and athetoid movements present in all positions but most intense on voluntary effort when ataxia also becomes evident. The right upper and lower extremities still show a definite weakness although there is no sign of atrophy or fibrillations anywhere. The abnormal movements are less evident in the muscles of the trunk and those supplied by the cranial nerves. They are more marked in the face and tongue and least in the eyes. Voluntary movement improves with continued effort and there is a tendency even to associated automatic movements in walking. There is alternating hypo- and hypertonia. There is no deformity or contractures. The emotional exhibition is a pleasant one even with painful stimuli. There are no disturbances of reflexes, sensation or cranial nerves beyond these adventitious movements. The vascular and elementary apparatuses do not present any abnormal condition. Her mental state seems to be fair, discounting for physical handicap.

II. TWO JUVENILE CASES OF MYASTHENIA

Dr. M. Neustaedter presented these cases: *Case 1.* R. S., aged eight and a half years, female, born in U. S. of Jewish parents who were second cousins before marriage. There is a history of tuberculosis in the family of her father; otherwise the family history is negative so far as could be elicited. She was born at full term after

normal labor; there was no oligopnea. Was breast and bottle fed; teething at seven or eight months was accompanied by a slight fever; sitting at six months; walking at sixteen months and talking at one year. Had pertussis and measles without any sequelae. Her tonsils and adenoids were removed three and a half years ago. She was constantly coughing from her birth up to the age of three years and habitually constipated up to the age of two. At the age of six months her mother noticed that she could not open her eyes, as completely as her normal brother. Only on rising after sleep would she open them completely and keep them open for about an hour. At present she would keep them up for three hours after a night's rest. During her first year she suffered from frequent attacks of dyspnea and at every attempt at vomiting she would become cyanotic for a few seconds. She was always weak on her legs and never ran with the ease of her brother. At the age of four years her mother noticed that, after walking a few minutes, she would become tired and unable to proceed and had to be carried. At present after walking two blocks she complains of pain in the legs and is forced to rest. She cannot walk stairs without holding on to something. Her arms are fairly strong, but, after writing about an hour, she is forced to stop on account of weakness. If pushed slightly she falls. Her school teacher reports as follows: "Ruth falls when she plays running or skipping games; she has difficulty going up and down stairs; every exercise seems to tax her strength so that she appears used up after any exercise; even in marching she lags and tires. In her school work she does well. In reading and writing she shows some nervousness and her voice is nasal in reading."

Physical status: Blood pressure is 70/50, pulse 108 and small; thoracic and abdominal viscera are normal; pupils are sluggish to light, accommodation cannot be tested for she has a complete ophthalmoplegia. There seems a slight mobility of the eyeballs downward. The fundi oculi show contracted arteries and injected veins, the discs are normal. There is a myopia. Superficial and deep reflexes are present. There are no sensory disturbances, the motor power is fair and there is no adiadochokinesis, but there is some hypotonia in all her muscles and they easily tire on passive motion. There is considerable weakness in all facial muscles, especially in the orbiculares palpebrarum and frontales. The response to the faradic and galvanic currents is normal, but there is a distinct myasthenic reaction in all the muscles of her extremities, which is absent at times after the administration of nux vomica for a few weeks. (Photographs of the child at various ages were shown.)

Case 2. L. G., aged ten years, female, born of American parents. There is a history of tuberculosis in both sides of her family and diabetes and neuropathy on her mother's side. "Lots of rheumatism" on both sides.

She was born after very difficult labor, rather late in the life of her mother, she being the last. Was breast fed for two months and then bottle fed; teething at ten months, walking at sixteen months and

talking at one year. Between the second and sixth week of her life she had three convulsions lasting several minutes. She had measles and influenza without sequelæ. Tonsillectomy two years ago. Suffers from chronic constipation. In school up to two years ago she did good work. She is left handed.

Two years ago she awoke with a peculiar cry and had an epileptic seizure of the grand mal type lasting several minutes. When out of the attack she vomited. These seizures came on mostly during sleep in intervals of five to ten days up to a year ago when she became subject to daily petit mal attacks, only one grand mal seizure since February of this year. She bit her lip and urinated during the attacks several times. There is history of trauma to the head four weeks before the onset of the first attack.

Early this year she began to experience difficulty in chewing and swallowing so that only semisolid food could be given and at times only in the recumbent position. At the same time she had difficulty with her speech, being unable to finish words, dropping the last syllable, until at the end of February this year she became completely aphonic. At this writing the mother informs me that she said a few words with difficulty and is beginning to chew solid food, and swallows better.

Physical status: Blood pressure 80/50; pulse 96, of good volume; thoracic and abdominal viscera normal; pupils respond promptly to light and accommodation; fundi oculi show the veins injected and pallor of the temporal disc in the left eye; the pharyngeal reflex is absent, all other superficial and deep reflexes are present; there are no sensory disturbances and no vocal cord paralyses; she protrudes the tongue with some difficulty and is unable to raise it to the roof; on attempting to move the tongue a considerable tremor sets in; there is flattening of the right facial muscles and she is unable to coapt the lips tightly; saliva is constantly drooling; there is complete aphonia. There is normal response to both electrical currents in all facial muscles. The myasthenic reactions could not be tested for. There is no disturbance in any of the other muscles.

In both cases, the blood Wassermann, chemistry and blood picture are negative; X-rays show no thymus shadow or any other abnormality. The interesting feature in case 1 is that the affection seems to have appeared before the first year of age. The earliest recorded cases, of two and a half years, was reported by Mailhouse. The second case came on quite early in life and was accompanied by so-called essential epilepsy. So far as I could discover in literature there is no case recorded associated with epilepsy.

Discussion—Dr. L. Pierce Clark said: Have you been over the literature recently with the idea of finding out the frequency of convulsions in these cases?

Dr. Neustaedter said: I believe these are two separate and distinct phases. I do not think the myasthenia has anything to do with epilepsy. I think it precedes the condition.

Dr. L. Pierce Clark said: I have never seen a case as young as

this and have never seen convulsions mentioned. I have been over the literature completely. You say the X-ray in this case showed nothing; has any chemical examination been made?

Dr. Neustaedter said: In a few cases acidosis was found, but nothing important as regards creatinin. The question in these cases is what is to be done. Dr. Dana suggests massive doses of strychnine, but I am afraid of large doses. I have used *nux vomica*, a strychnine reaction.

Dr. I. Abrahamson said: *Myasthenia gravis* at six months of age is very rare; the persistence of the signs and symptoms without remissions, rare; other features are rare; too many exceptions to the rule are not apt to be present in one case. The question of infantile nuclear aplasia or progressive nuclear disease must be borne in mind. Upon the facts as presented, further observation is necessary before a definite diagnosis is likely. The other child is a very peculiar case, especially in regard to the sudden and complete aphonia.

Dr. M. Neustaedter said: I said that the aphonia was gradual, preceded by partial aphonia, or clipping of words. I have had her on the hospital service for eight days, on a mixed diet. She has had one petit mal attack without loss of consciousness. During that time I tried to persuade her to talk but without result. In regard to the girl with ptosis, I thought first of hypoplasia of the third, fourth and sixth. I have seen a congenital double facial paralysis which was of nuclear origin. But here you have the muscles of the legs and arms, giving the full myasthenic reaction again and again. I think we must rule out hypoplasia of nuclear origin. This case is practically at a standstill, but we have cases in the literature that are similar. In the picture taken at eight months, the ptosis did not show, but the mother explained that the child had just been awakened from sleep and the ptosis was not present shortly after sleep.

Dr. T. K. Davis said: I would like to question the diagnosis of the second case. I should think the occurrence of the grand mal and petit mal attacks would first of all raise a question. Also is there any variability in the paretic symptoms of the tongue? Do they vary as they do in myasthenia?

Dr. M. Neustaedter said: The paralysis of the tongue is progressive. She is unable to lift the tongue. She has a slight facial paralysis. She is unable to close the lips and she has a difficulty in swallowing which is progressive. The aphonia does not suggest nuclear origin although some myasthenias begin that way.

Dr. T. K. Davis said: That looks to me like pseudobulbar paralysis, and not myasthenia.

Dr. M. Neustaedter said: There is involvement of the seventh and twelfth and motor nucleus of the fifth. What would be the etiological factor which would take in three peripheral nerves so far apart? These cases are described by Oppenheim as bulbar paralyses without anatomical findings.

SOME UNUSUAL FORMS OF PSYCHOGENIC EPILEPSY

DR. L. PIERCE CLARK (Author's Abstract)

There are few nervous diseases so unique in symptoms or pathology as to warrant the statement that they have no anomalous forms. Essential epilepsy is no exception. Some of the names which have been given to the variable and irregular group of essential epilepsies are "emotional epilepsy," "hystero-epilepsy," "affective epilepsy," and "para-epilepsy." The chief significance of these irregular types is that they possess ethical perversions in personality makeup that are so glaring as to overpower the picture of infrequent seizures. Secondly, they generally have a favorable prognosis so far as riddance of the convulsive phenomena is concerned; but there is some doubt as to whether the ethical perversions do not continue and gradually pass into specific and enduring antisocial deterioration.

The outstanding syndrome as the basis of the unclassified type is undue and labile affectability. In most instances the seizure phenomena are not essentially dissimilar to those seen in essential epilepsy, from which it is differentiated only with the greatest of care, not on the basis of the type of the seizures but the antecedent or subsequent mental state.

Unfortunately, both for the physician and the patient, there are fewer of the so-called affect epilepsies than one would wish to suppose. They are essentially to be characterized by (1) psychogenetic factors; (2) absence of the makeup of the essential epileptic as well as his enduring mental stigmata (deterioration); (3) intractability to sedative therapy; and (4) response to psychotherapeutics, analysis and training.

In consideration of the affective epilepsies in childhood, obviously the personality makeup of the essential epileptic is largely wanting. As many of these young patients recover either spontaneously or their symptoms are early outgrown under the physician's or pediatricist's care, neuropsychiatric studies are not frequent. Perhaps the observer who has most thoroughly studied these peculiar types in children is Stier. The condition is not so infrequent as his observations would seem to imply; but that it often is diagnosed incorrectly as hysteria or a condition of spasmophilia of childhood is quite likely. The state does not constitute a distinct clinical entity. Some of the children are obviously suffering from the beginnings of essential epilepsy and after a more or less brief pause continue an epileptic career; others have a mixture of symptoms not so very different in general outline from those of anomalous spasmophilics; while still others have symptoms not essentially dissimilar to "anger" or "opportunity convulsions," which closely ally them to some of the protean forms of hysteria of childhood and early adolescence. A few would seem to be but a very early form of the affect group and not unlike the Westphal type of affect epilepsy. Many of the latter also in turn shade into essential epileptics on the one hand and pure psychopaths on the other. Finally, the material in the affect

group will also prove not very dissimilar in many instances to the anomalous material of dementia precox and epilepsy in which it is a nice question whether the latter exists as an association disease or as an atypical form of dementia precox on the one hand and an anomalous essential epilepsy on the other.

In the entire service at Manhattan State Hospital, under institutional care at the present time, I found but a dozen cases of dementia precox, who had one or more convulsions. Without exception, there was an absence of the epileptic makeup and none came within the range of the epileptic type. The ages of the patients ranged from twenty-two to fifty years. The type of makeup was typically that seen in the dementia precox of paranoid and hebephrenic types. In the cases in which but one attack occurred, in one patient the seizure was described as a dizzy spell or faint as the result of being overcome with the heat; in another there was a convulsion in which the patient became purple and foamed at the mouth. One male patient fell from a tree at eleven years of age when he became unconscious a few minutes but made good recovery from his physical injuries after six months; he had previously had convulsions at the age of four and a half years. Another male patient had nocturnal convulsions at the age of eight years which continued to the age of fourteen; he is now twenty-eight years old and there have been no convulsive phenomena for fourteen years. Another male patient, aged thirty-four, had convulsions at fourteen averaging one every six months, the last occurring three years ago; his present makeup is dull and apathetic and he has catatonic states. One male, aged 40, had convulsions which were purely specific; he contracted syphilis at nineteen. In the remaining cases studied, the convulsions came within the range of spasmodic of childhood.

In conclusion we may say that the so-called affect epilepsies in the adult prove most frequently to be really psychoneuroses, protean forms of hysteria, most commonly. The respiratory affect convulsions of childhood need our continued study to eliminate them from the beginnings of essential epilepsy. This task is both a pediatric and a neurologic one. Finally, the supposed occurrence of discharge convulsions in dementia precox is much rarer the more definite the syndrome of dementia precox is made. It seems unlikely that there is an association disease of dementia precox and epilepsy. The disease entity is either one or the other. True epileptic attacks are rare outside of the essential type except in organic brain disease or as an occasional accompaniment of internal disorders such as diabetes, nephritis, and the like.

Discussion—Dr. M. W. Raynor said: I have been very much interested in Dr. Clark's paper and especially in his study of the various types of convulsive phenomena in epilepsy. I feel that his paper is a real contribution to the subject of epilepsy. I cannot recall a single instance in which a true epileptoid seizure occurred in dementia precox in my several years experience. There have been syncopal attacks but not true convulsions. I have, however, seen a

few cases with manic syndromes which have later developed epileptic convulsions.

Dr. L. Pierce Clark (closing) said: I had hoped to get some of the pediatricians here, as I have obtained most of my clinical material from them, especially from Dr. Kerley. I think it is important for the relief of the parents that this group of cases should be taken out of the category of true epilepsy. I believe it is very important for the pediatricist to coöperate with the neurologist in these cases. In regard to the precox types, I failed to find an association of the two disorders in this clinical material. Kahlbaum and others have confused hyperkinesis with epileptic phenomena, and this should be corrected. I have seen one patient, a man of twenty-nine, a dangerous type, with paranoia. The sensorium was clear but he had two or three periods of typical epileptic convulsions of the grand mal type. These were temporary and have not recurred. It is preposterous to assert, as do some workers, that the association percentage of epilepsy with dementia precox runs as high as 25 per cent.

IN MEMORIAM

The New York Neurological Society at its 406th regular meeting, October 2, 1923, adopted the following resolutions:

WHEREAS, It has pleased God in His infinite wisdom to remove from us our fellow member, Paul Waterman, of Hartford, Connecticut; and

WHEREAS, The Society feels that in his death it has lost a friend distinguished alike in his chosen field of medicine, in the civic life of his city and state, and in the service of his country in the World War; be it

RESOLVED, That the members of the New York Neurological Society extend their most sincere sympathy to the family and friends of Colonel Waterman; and

RESOLVED, That copies of these resolutions be sent to the family, to the JOURNAL OF NERVOUS AND MENTAL DISEASE, the *Am. Archives of Neurology and Psychiatry*, the *New York Medical Journal and Record*, and a copy in the Archives of the Society.

EDWIN G. ZABRISKIE, President

L. PIERCE CLARK,

CHAS. E. ATWOOD, Secretary

Committee from the Council

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY.

2. ENDOCRINOPATHIES

Eiselsberg. PARATHYROPRIVAL TETANY. [Arch. f. klin. Chir., November 24, 1921, 118.]

Eiselsberg here reports a recent case, and reviews his total experience. The postoperative tetany proved fatal in 9 cases, and in 2 that date from Billroth's day, tetany persisted unmodified during the thirty-nine and twenty-one years till death. He has had 8 cases of severe and about 24 cases of mild postoperative tetany in twenty years, in a total of 2,588 strumectomies, including 215 for exophthalmic goiter. He adds that Vienna seems to be a center for spontaneous tetany. Even the mildest form of postoperative tetany is dangerous, as cataract may develop years later. Parathyroid and calcium lactate treatment of parathyreopriva tetany was frequently effectual, but in 2 cases he implanted thyroid tissue in treatment, parathyroid not being available at the time. Transient benefit followed in one case. In 7 other patients he implanted parathyroid tissue, and decided and durable benefit was realized in 3 cases; one patient died from pneumonia and no effect was apparent in the 3 others. The parathyroids had been taken from newborn infants in 2 of the cases, but no effect was apparent, as also with monkey parathyroids in 2 cases. About 20 cases of human parathyroid implants are on record. The outcome is difficult to estimate. In a later article [Wien. klin. Woch., January 5, 1922], Eiselsberg states that of 2,588 strumectomies performed during the last twenty years, he observed 6 fatal cases due to tetany. In 4 cases more or less extensive pneumonia was found at necropsy. Three of the operations were necessary owing to relapses. General anesthesia was employed in only one case. In one case spontaneous tetany had occurred before the operation; immediately after the operation the symptoms became exceedingly severe, and death resulted in four hours. In 2 of these 4 cases, transplantation of parathyroids had been done. Besides the 6 fatal cases of tetany, there were 6 other severe cases. In a woman of thirty-two the tetany became chronic; a cataract developed; transplantation of thyroid and later of parathyroids was done, which brought about improvement. Later, during the cold season, paroxysms of tetany were frequent, whereby thyroid treatment helped. In one patient the eating of bread precipitated the attack of tetany. In one woman, bilateral

cataract developed eleven years after the operation. A similar case of formation of bilateral cataract occurred in a Vienna hospital after operation. In addition there were a number of cases of mild tetany. Symptoms resulting from removal of thyroid are not helped by drugs; only organotherapy is efficacious. On the other hand, symptoms arising after removal of the parathyroids may often be relieved by the use of drugs. Sometimes epilepsy develops from tetany, in which transition the loss of the parathyroids plays a part. [J. A. M. A.]

Schultze. CHVOSTEK SIGN IN SCHOOLCHILDREN. [Monats. f. Kind., December 1921, XXII, No. 3.]

This is an interesting research upon this most characteristic of the tetany signs. He examined 1,648 school boys and girls and found this sign in 8.4 per cent. Of the 139 positive cases, 127 were examined with respect to electric hyperexcitability, which was found to exist in 58 per cent. He found that more than two thirds of the schoolchildren with a positive Chvostek sign could be regarded as spasmophilic, and two thirds of them were underdeveloped physically. From the mental and intellectual point of view there were only 39 children out of 178 that could be regarded as healthily average. Mechanical hyperexcitability of the facial nerve trunk was not so frequent in the girls as in the boys.

Scherer. MANIFESTATIONS OF SPASMOPHILIC DIATHESIS IN OLDER CHILDREN. [Minn. Med., March 1922, V, No. 3.]

This author would stress the clinical significance of electrical excitability as a better mode of getting at the spasmophilic diathesis than the chemical study of the blood. The condition is relieved by the use of liberal doses of calcium 6 gm. in twenty-four hours combined with cod liver oil, 8 c.c., twice daily. Increased electrical reactions were noted in six cases. These six children were brought in for examination because of extreme restlessness, peevishness, anorexia and disturbed sleep.

Giebel, W. PRIMARY TUMORS OF THE PINEAL BODY. [Frankf. Zschr. f. Path., 1921, Vol. XXV, No. 1.]

The author gives the description of two pineal tumors. The first case is that of a twenty-five year old musician and well-known composer who mentally had developed very early. Thus at fourteen years of age he had already produced compositions which were performed in theaters and created some sensation. Evidence of any sort of sexual precocity was wanting. Autopsy showed at the location of the epiphysis a tumor perhaps as large as a chestnut which microscopically was considered by the author as a sarcoma of polymorphous cells, the picture of which was complicated by features of lymphoid infiltration and individual eosinophilic cells. In no portion could true ephyseal parenchyma be demonstrated.

The second case was that of a student of fifteen years of age. Nothing could be obtained from his anamnesis. He came to autopsy with the clinical diagnosis "brain tumor (?)". In him there was found at the location of the epiphysis a spherical tumor larger than a walnut with two lumpy protuberances which affected the adjacent brain substance compressing and excavating it. The tumor was mostly cystic in formation and richly supplied with atheromatous pulp. There could be demonstrated in the wall on one spot a bit of skin with hair rudiment and hair follicle glands. It was therefore a case of a dermoid. Unfortunately we learn nothing as to the question whether normal epiphyseal tissue was also present and nothing in regard to the condition of the other glands of internal secretion in this or in the first case. In this regard the author at the close gives a brief survey of the cases of epiphyseal tumors which so far have become known. He numbers 53, which are sarcomata 13, teratomata 10, cysts 7, hyperplasias 7, gliomata 5, psammomata 3, carcinomata 3, angioma 1, undefined 4.

Zandén, Sven. A CONTRIBUTION TO THE STUDY OF THE FUNCTION OF GLANDULA PINEALIS. [Acta Medica Scandinav., Vol. LIV, 1921.]

The author gives an account of a case of infantilism in a sixteen year old youth. The symptoms appeared at the age of ten and showed themselves chiefly in a considerable retardation of physical growth and a total absence of all secondary sexual traits. When the case, at the age of sixteen and one-half, after a pneumonic disease ended in death, it was found on the adduction, that the pineal gland was totally lacking, both macroscopically and at the microscopic examination. The other internal secretory organs showed on the whole a normal microscopic appearance with the exception of testes, which showed the histological structure of a baby.

In connection with this unique case the function of the pineal gland is discussed. The hitherto assumed hypothesis, which has mainly been arrived at through the clinical observations on epiphysis tumors with the symptom of macrogenitosomia precox and which goes to show that the pineal gland has the purpose of preventing the puberty does not explain the symptoms in this case. The author comes to the following conclusions: (1) The pineal gland has during the childhood no vital function to fulfill. (2) The granulation of the pineal cells, observed by the anatomists at the age of nine or ten, which has hitherto been interpreted as a sign of involution, is on the contrary a manifestation of the beginning of cell activity. (3) The principal task of the pineal gland is the initiation of puberty. This is probably effected by an interaction between the epiphysis and other internal secretory glands,—in the first place the sexual glands. The symptom macrogenitosomia precox, observed in ten cases of pineal tumors, is presumably caused by a hyperactivity of the gland in relation to the age, and not as before is assumed as a manifestation of destroyed function. That two of the

ten cases of pineal tumors has proved to be pineal struma, a tumor structure, which in other organs is generally accompanied by hyperactivity, may be regarded as in support of this view. Even in regard to the other cases, composed of malignant tumors, the assumption of prematurely starting function is not inconceivable according to what has been observed in malignant thyroid tumors. [Author's abstract.]

Further notes in this case are of interest: Patient, youngest of six, developed normally for the first six years. At nine or ten gradual tiredness, shortness of breath and cyanosis on walking upstairs, and pressure and pains in heart region after running. At thirteen anemia with pale, sallow complexion. Soon he stopped growing; gained only three kilos in weight in three years (normal=thirteen). When sixteen looked twelve; height only 140 cm. (normal for twelve); weight 34 kilos. Genitals of a boy of ten or eleven; skeleton well-shaped. Hand bones (by X-ray) those of boy of thirteen; teeth defective. No hair on pubes, axillæ, or lips; thyroid scarcely palpable. Penis three cm. length; testes very small, normal position; erections and emissions not observed. Psychically shows many childish traits, but no serious mental deficiency; passed through school training, but with difficulty. Heart, systolic murmur over base; the anemia is of secondary type. Wassermann negative in blood. Diagnosis is infantilism with anemia. Three months later, after leaving hospital, dyspepsia; vomited a coffee-cupful of blood. Two days later severe epigastric pains, rapid pulse, temperature 36°. Next day, laparotomy; no perforating gastric ulcer, and no peritonitis. Sudden death next day, collapsed. Necropsy: condition of muscles rather below average. No pineal body. Pituitary normal size. Testes those of baby (tubuli contorti small; inside the tunica were found Sertoli's cells and seminal cells; the latter showed no spermatogenesis; the internal secretory cells are entirely absent. Between the various tubules was a rather rich, loose connective tissue). Pituitary and adrenals normal structure. Thymus pale, weighs nine grm., otherwise nil. Thyroid normal size, pale, weighs 19 grm.; much colloid in follicles; normal epithelium; no enlargement of its connective tissue. Bone marrow; megalokaryocytes occur sparsely; otherwise nil. A part, about two c.c. in size, round the line of attachment of the epiphysis was embedded and cut in series; throughout all the sections normal brain tissue; no epithelioid elements. Zandrén argues that the function of the pineal is not to inhibit puberty, but to start its development; he suggests that macrogenitosomia precox, as the consequence of a pineal tumor, may be due to a premature functioning of pineal tumor-cells. The principal task of the pineal is, he thinks, the initiation of puberty; this is probably effected by an interaction between it and the sexual glands. The hormones of the pineal thus exercise a stimulating influence on the sexual glands, which are doubtless responsible for most of the physical and mental changes directly connected with puberty. The granulation

of the cells, observed by the anatomists at the age of eight or nine, may possibly be the anatomical basis of the secretion. The symptom-complex macrogenitosomia precox is presumably caused by a gland which exercises a hyperactivity in relation to the age. The absence of involution even at an advanced age (Krabbe, Schlesinger) argues that the pineal has internal secretory functions also after puberty. "My view does not exclude the assumption that a continuous correlation may take place between the epiphysis and the sexual glands." [Leonard J. Kidd, London, England.]

Boehm. PINEAL TERATOMATA AND SEXUAL PRECOCITY. [Frankfurter Zeit. für Path. and Zentralbl. für Gynak., October 1, 1921.]

This interesting study involves sixty records of tumors of the pineal gland seventeen of which could be classed as teratomata. In seven of these and in five sarcomatous tumors there was a record of precocity in genital and also usually in bodily development; without exception the individuals concerned were males from four to sixteen years. According to the author there is ground for suspecting a reciprocal influence between the pineal and testicular internal secretions. It is possible that the pineal gland possesses the function of keeping in abeyance until the onset of puberty the development of the primary and secondary sexual characters. (Precocious puberty in females shows, on the other hand, no dependence on or connection with the pineal gland.) The case is related of a boy, aged nine and one-half, who, together with the clinical signs of cerebral tumor, showed precocious development of the genital organs and premature secondary sexual characters. Autopsy showed a pineal tumor the size of a pigeon's egg which microscopically proved to be of teratomatous nature, containing derivatives of the three blastodermic layers. There were numerous large cells with abundant cytoplasm and round vesicular nuclei which recalled the appearance of Leydig's testicular cells. (See preceding abstract of Zandrén's.)

Dandy. OPERATIVE TREATMENT OF PINEAL TUMORS [Surg., Gyn., and Obstet., August 1921.]

This author, an aggressive operator, maintains the only useful treatment of pineal tumors is by surgical methods. No benefit, he holds, can possibly accrue either from a decompression operation or from puncture of the corpus callosum. In dogs the pineal gland can be removed without mortality and without subsequent physical or mental deterioration. He describes a similar operation which he has performed three times in human subjects. A very large parietal occipital bone-flap, the mesial margin of which extends to the superior longitudinal sinus, is turned downwards, and the dura is reflected over the inferior longitudinal sinus. By a puncture of the lateral ventricle the intracerebral pressure, and consequently the volume of brain, in the field of operation is reduced, and subsequently the cerebral hemisphere is retracted, exposing the corpus

callosum and the falx. By longitudinal division of the corpus callosum the tumor of the pineal is exposed, together with the entire length of the vena galena magna and the terminus of each small vein of Galen. This operation has been performed in three cases. In the first case, because of the infiltrating character of the tumor, no attempt was made to remove it. In the second case an encapsulated tumor measuring 5 by 4 cm., and regarded at the time as an endothelioma but afterwards proved to be a tuberculoma, was removed; the patient recovered, but died eight months later, presumably from the effects of other cerebral tuberculous lesions. The tumor in the third case was much larger, and as a preliminary to its enucleation excisions of the veins of Galen were required; the patient died forty-eight hours later.

Lereboullet and Brizard. A PINEAL TUMOR. [Presse Médicale, January 4, 1922, 7.]

A boy showed signs suggestive of a pineal tumor, viz., macrogenitosomia precox and increased intracranial tension, and soon afterwards died. Necropsy revealed a pineal tumor of the size of a Tangerine orange; the tumor had compressed the corpora quadrigemina, deformed the neighboring parts and invaded almost the whole of the third ventricle. The pituitary was flattened and the lateral ventricles extremely dilated. Most of the endocrine glands were hyperemic and increased in size, especially the thymus and thyroid; the testes were twice the size normal for the boy's age. Histologically, the tumor was a neuroepithelioglioma in which apparently epithelial and neuroglial elements could be distinguished. [Leonard J. Kidd, London, England.]

Löwenthal, K. ON THE PATHOLOGY OF THE PINEAL BODY. [Beitr. z. path. Anat. u. z. allg. Path., 1920, LXVII, 207.]

A young man of twenty-three years of age developed a tumor of the pineal body, the first clinical manifestation of which was a progressive obesity. The other symptoms and signs of increased brain-pressure made their appearance only at a later stage. The tumor was epithelial in structure and similar to the functioning pineal gland of the new-born. This observation supports the view that fatty metabolism can be modified directly through pineal activity, and points to the possible existence of a form of obesity due to hyperpinealism. [Da Fano.]

Brösamlen. ADRENALIN HYPERGLYCEMIA. [Deutsches Arch. f. klin. Med., 1921, CXXXVII, 299. Med. Sc.]

While adrenalin always produces a hyperglycemia when injected subcutaneously, a glycosuria was only found four times in 35 experiments. In each case the subject was pathological. The hyperglycemia always takes place much later than the effect which the drug produces on the pulse and blood-pressure. The high point of the blood-sugar curve occurs at a time when both pulse and pressure have practically

regained their normal level. The blood-sugar curves in diabetes were not always similar. In some there was a fall in the amount of sugar in the blood which afterwards rose slowly. In other cases the hyperglycemia was very pronounced, even more so than in healthy subjects. It is possible that an analysis of these curves might lead to a separation of cases of diabetes which are, on the one hand, of pancreatic origin and, on the other, are due to nervous disturbance.

Levin. THE RELATION OF RECKLINGHAUSEN'S DISEASE TO THE ENDOCRINE SYSTEM. [Arch. Derm. and Syph., September 1921.]

The literature on Recklinghausen's disease is here given in extenso, and the author adds thereto his own case report. In addition to the usual symptoms a number of associated disorders affecting the body generally are noted. These are: (1) arthralgic pains, formication, and hyperesthesias; (2) motor disorders, as muscular incoördination, increase of reflexes, and asthenia; (3) psychic symptoms, as loss of memory, apathy, speech defects, and depression; (4) developmental defects, as facial asymmetry, syndactylism, scoliosis, osteomalacia, infantilism and kyphosis; (5) digestive complaints, as nausea, anorexia, and vomiting. An association of the disease with endocrinopathies seems to be common, and it would appear probable that many of the symptoms should be referred to the endocrinopathy. Many cases are quoted from the literature showing a very distinct relationship between the onset, course, and aggravation of the disease and quite definite anomalies in the physiology of the thyroid, pituitary, suprarenal, and sex glands. Of 14 cases of Recklinghausen's disease in which the endocrine system was examined at autopsy, 12 showed during life a more or less complete Addisonian syndrome, while the same number revealed at post mortem examination involvement of the suprarenals and other glands. The conclusion is drawn that the disease is a complex of cutaneous and general symptoms depending for its etiology on a polyglandular endocrinopathy.

Stewart, G. N., and Rogoff, J. M. MUSCULAR EXERCISE ADRENALS, BODY TEMPERATURE, PULSE AND RESPIRATORY FREQUENCY. [J. Pharmacol. and Exper. Therap., 1922, XIX, 87. Med. Sc.]

It is widely held that muscular weakness is a symptom of adrenal insufficiency, and often assumed that interference with the epinephrin output is the factor essentially responsible for muscular weakness. Normal cats and cats after removal of the greater portion of the adrenal tissues or interference with adrenaline production by section of the nerves, were subjected to prolonged and repeated spells of muscular exercises. No difference was made out as regards resistance to, or recovery from, fatigue, or as regards changes in rectal temperature, pulse, or respiratory rate. After severe muscular exertion a definite decrease of the adrenal content of an adrenal with its innervation intact,

as compared with its previously denervated fellow, was observed, but only when the fatigue was excessive.

Black, E. M., Hupper, M., and Rogers, J. ADRENAL FEEDING AND THE IODINE CONTENT OF THE THYROID. [Am. J. Physiol., 1922, LIX, 222. Med. Sc.]

Feeding with a protein-free extract of the entire adrenal gland produces a distinct increase in the iodine content of the thyroid gland. The extract contained some adrenalin, but a corresponding amount of pure adrenalin alone produced a distinctly smaller increase in the iodine content.

Marine, D., and Baumann, E. J. EFFECT OF SUPRARENAL INSUFFICIENCY (BY REMOVAL) IN THYROIDECTOMIZED RABBITS. [Am. J. Physiol., 1922, LIX, 353. Med. Sc.]

Removal of the adrenals leads, in rabbits, frequently to increased heat-production. This is attributed to the absence of the cortex. If previous to adrenalectomy the thyroids have been removed this rise in heat production is prevented. It is therefore dependent on the presence of the thyroid gland and is due to an increased functional activity of this gland. The authors make the speculative suggestion that the cortex exercise a restraining or inhibitory control over the thyroid gland, while the medulla, by secreting adrenalin, can stimulate the thyroid. They also suggest, on the basis of this speculation, that exophthalmic goiter may be due to loss of cortical control over the thyroid through weakness or exhaustion of the cortical function.

Rice. ADRENALINE AND SHOCK. [Bull. of the Johns Hopkins Hosp., March 1922.]

In this experimental research anesthetized cats were subjected to shock-producing trauma, and the time taken for the blood pressure to fall to 60 mm. and the symptoms of shock to appear was recorded. Similar experiments were carried out on animals whose adrenals had been previously removed by the extraperitoneal route, and the following results were obtained. The time required for the production of shock and the character of the blood-pressure curves was the same in animals whose adrenals had just been removed as in normal controls, which proves that disordered adrenal function is not a factor in the production of shock. On the other hand, the blood pressure of the adrenalectomized animal begins to fall about four hours after the adrenals are removed, and within the first twelve hours after adrenalectomy the blood pressure in the unanesthetized animal invariably falls to a very low level and progressively declines until death. This fall in blood pressure is independent of operative trauma and begins before asthenia has appeared, which suggests that the adrenals are concerned in the maintenance of the blood pressure at the normal level. With regard to the influence of the

anesthetic it was found that animals which were kept lightly anesthetized with ether for an hour immediately before the abdomen was opened were very resistant to the shock-producing effect of intestinal manipulation. On the other hand, if identical intestinal manipulations were commenced immediately after anesthetization then symptoms of shock appeared more rapidly. This protective effect of preliminary ether anesthetization was met with repeatedly, but once the blood pressure had commenced to decline ether anesthesia had a distinct tendency to hasten the onset of shock. The author could find no evidence that cardiac failure is a factor in the production of shock, or that failure of the vasomotor center is a primary factor in shock. The cardioinhibitory center was shown to respond to stimuli and also to function independently in deep shock. [B. M. J.]

Hoxie, G. H., and Morris, H. T. EPINEPHRIN IN ASTHMA. [Endocrinology, January-March 1920, IV, No. 1.]

In this clinical paper the history of a case of asthma of six years' duration is recorded in which the patient had taken approximately 7 c.c. of epinephrin daily, for the most part hypodermically and an occasional use of morphin and chloroform. She died suddenly after an injection of epinephrin. The chief post mortem findings were congestion of the abdominal viscera, similar to that found in animals dead from epinephrin administration, a collapse of the right lung and beginning arteriosclerosis.

Bergstrand, H. SUPRARENAL CYTOMA. [Hygiea, May 31, 1920, LXXXII, No. 10.]

This is a pathological report of a pleocytoma of the right suprarenal gland. It was accompanied by hypertrophy of the myocardium of the left heart. Chronic excessive suprarenal functioning due to the stimulus of the tumor cells is given as the probable explanation of the cardiac hypertrophy.

II. SENSORI-MOTOR NEUROLOGY.

2. SPINAL CORD.

Étienne, Stroup and Benech. MYELITIS IN ADULTS. [Bull. d. l. Soc. Méd. des Hôp., January 20, 1922, XLVI, No. 2.]

Three new cases are reported of the cure of acute myelitis in adults under antipoliomyelitis serum. In one the paraplegia had developed suddenly the third day of an infectious sore throat. The paralysis of the legs was total, and the arms showed slight paresis. The serotherapy was begun the fourth day of the paralysis, and by the fourteenth all the symptoms had retrogressed under it in the first case. The myelitis was more diffuse in the other cases, and the antiserum was not given till the ninth week, but the man of forty was able to get up and walk the tenth day.

Regan and Cheney. VALUE OF ROUTINE USE OF COLLOIDAL GOLD REACTION IN ACUTE EPIDEMIC POLIOMYELITIS. [Am. Jour. of Dis. of Children, February 1922, XXIII, No. 2.]

Regan and Cheney here report on the colloidal gold test in seventy-four spinal fluids of twenty-one cases of epidemic poliomyelitis. The fluids were examined at varying intervals as early as the fourth and as late as the one hundred and twenty-third day of the disease. The predominant type of the malady was myelitic. A high proportion of cases showed moderate or marked polyneuritis. The authors believe that there is a relationship between the duration of the positive colloidal gold curve and the acute inflammatory stage of the malady. When the reduction of gold becomes normal, the acute period is over. The reaction, therefore, should be of value in determining when the rest of the acute period may be terminated, and the energetic treatment of the subacute stage begun. With the subsidence of the colloidal curve there is improvement in the general condition, paralysis and meningeal symptoms. No close relationship was found, except in a general way, between the cytology and chemistry of the spinal fluid and the gold chlorid reaction. As the very acute symptoms subsided, the spinal fluid, in its chemical and cytologic contents, returned to normal. So, in most cases, does the gold chlorid curve return to normal, but more slowly, usually still remaining elevated at a period (eighth week) when no other characteristic pathologic signs are to be found in the cerebrospinal fluid. The average curve in the fatal cases, although showing a tendency to produce greater reduction and to be prolonged slightly into the higher dilutions, did not differ sufficiently from that obtained in the nonfatal cases in the first few weeks as to make the test of value in prognosis. In the few instances in which poliomyelitis may be confused with epidemic encephalitis; the colloidal gold reaction may be of some use in differential diagnosis. To realize the full value of this reaction, it must be taken into consideration with the history, physical findings and other laboratory data.

Long. PROGRESSIVE AMYOTROPHY OF THE EXTREMITIES. [Rev. Méd. de la Suisse Romande, January 1922, p. 51.]

Long has shown to the Geneva Medical Society a man, fifty-five, in whom a slowly progressive amyotrophy of the extremities has been present for four years: it began in the hands, forearms, feet, and legs: it has now extended to the thighs, but upper arms and shoulders are free. There are fibrillary tremors, spontaneous pains without objective sensory changes, abolition or diminution of tendon-jerks, and an incomplete reaction of degeneration, but no affection of eyes or of sphincters. The topography of this muscular atrophy suggests the Charcot-Marie type, although it came on so late in life and there are no similar cases in the family. But cases like this have been published which showed degeneration of peripheral nerves. Possibly this case is one of a type transi-

tional between the Charcot-Marie form and the hypertrophic interstitial neuritic form of Dejerine and Sottas. [Leonard J. Kidd, London, England.]

Bordier, H. TREATMENT OF INFANTILE PARALYSIS. [Arch. of Rad. and Electrotherapy, December 1921, XXVI, No. 257. J. A. M. A.]

Bordier claims that prognosis of infantile paralysis is far from being so grave as certain practitioners think. Therapeutic results obtained by modern procedures, and in particular by diathermy, radiotherapy and galvanization, prove that infantile paralysis can be, if not completely cured, at least transformed into an affection which carries with it neither infirmities nor complete crippledom. The first therapeutic indication consists in acting on the medullary lesion by means of radiotherapy. Although radiotherapy does not pretend to reconstitute nerve cells which are completely atrophied, it must have the effect of reestablishing the cells incompletely destroyed and of arresting the progress of the poliomyelitis. The treatment must be undertaken as early as possible. The second indication is to combat the lowering of the temperature, not only of the atrophied muscles but of the limb to which these atrophied muscles belong. The most efficacious means to bring the temperature of a chilled limb to its normal amount is diathermy. When the affected limb is as warm as the other, electrical treatment must be commenced; this will be applied according to the results of the electrodiagnostic examination, and chiefly consists in rhythmic and reversed galvanization of the muscles presenting the reaction of degeneration complete or partial. This treatment must be followed carefully and persistently for months, or even for years, if necessary, if a satisfactory result is to be obtained in any of these cases.

Arntzenius, A. K. W. CASES OF HEINE-MEDIN DISEASE. [Nederlandsch Tijdschr. voor Geneeskunde, February 25, 1922, LXVI, 818.]

Arntzenius reports to the Netherlands Pediatric Society three cases of Heine-Medin disease occurring in one family: three cases of acute poliomyelitis occurred in the same little village at the same time. A five year old girl had abdominal pain and headache, followed a week later by neck-pain, nausea, and somnolence: next day right facial palsy beginning in lower branches and then extending to upper. In two days temperature normal and somnolence less: the latter disappeared in a week. A week after the facial palsy she had abducens palsy on the opposite side, which quickly recovered. Normal jerks, and no signs of Kernig, Babinski, nor Chvostek: no opisthotonos nor cutaneous hyperesthesia. Her brother, six years old, was sleepy next day with neck-pains, nausea, and slight neck-stiffness with a suspicion of Kernig, and a red throat. Extreme somnolence: temperature 38.3°. Three months previously he had severe diphtheria with cardiac affection. He had no palsies, and quickly recovered. In both cases the possibility of lethar-

gic encephalitis was considered. The third case was a boy of two years who, after a week of abdominal pain, fell on his occiput—without any apparent harm—and then two days later vomited and had neck-pains: temperature 39.9°, and a complete left facial palsy: knee-jerks very feeble: on right, a slight Babinski sign. The speech is lalling (probably a hypoglossal palsy). Somnolence and definite neck-stiffness: no Kernig nor cutaneous hyperesthesia: pupils equal, medium size: normal abdominal reflexes. Clear spinal fluid, under high pressure: slight hyperalbuminosis and a few lymphocytes. Recovery complete after two months. The writer regards these three cases as abortive forms of the Heine-Medin disease: the somnolence, which at first suggested lethargic encephalitis, has been often found in cases of acute poliomyelitis. [Leonard J. Kidd, London, England.]

Amoss. SERUM TREATMENT OF ACUTE POLIOMYELITIS. [Journ. Amer. Med. Assoc., January 1921.]

The author urges the administration of serum as early as possible, since it is of doubtful value after the febrile period has passed. Seeing that the only available source of serum for treatment is from persons who have recovered from an attack of poliomyelitis, it should be collected and tested as soon as possible after an epidemic has appeared in a region, and while the needle is still *in situ* for lumbar puncture the fluid should be examined for cells and globulin, and warmed serum given through the same needle if the diagnosis is positive. After the intraspinal injection warmed serum is given intravenously, and both injections may be repeated in twenty-four hours if the temperature has not become normal. In the intraspinal administration the amount of serum injected varies according to the amount of fluid withdrawn and the estimated pressure, the amount in cubic centimeters less 10 being injected by the gravity method, unless the pressure is very high, when correspondingly less should be given. Intravenously 40 c.c. may be injected for children up to two years, a child of nine receiving 80 to 100 c.c. White serum even slightly tinged with hemoglobin should not be used either intraspinaly or intravenously; it may be given subcutaneously, but deeply colored serum should be discarded.

Claude, Henri, and Schaeffer, H. COMBINED SCLEROSIS. [Revue Neurologique, No. 9, 1920.]

Combined sclerosis is here discussed apropos of a case however in which, contrary to what is usual, signs of grave anemia were wanting. The patient, a woman, sixty-seven years old, showed spastic paraplegia, with exaggeration of all tendon reflexes and a definite Babinski reaction. There was also impairment of deep muscle, joint and bone sensibility, but preservation of sensibility to touch, heat, pain and cold. Ataxia affected arms and legs alike. All these clinical manifestations had arisen within a period of fifteen months preceding death. Microscopic

examination of the spinal cord showed sclerosis of the tracts of Goll and of the inner portion of the tracts of Burdach in the posterior columns; and of the crossed pyramidal tracts and to some extent the direct and anterolateral cerebellar tracts in the lateral columns. Clinically and anatomically the case resembles previously published cases, but in the absence of anemia the cause is obscure. In consideration of the woman's age, it is assumed that responsibility may be placed on some progressive organic degeneration comparable with anemia. As she manifested no signs of anemia the blood was not examined.

Giannuli. PSEUDOSYRINGOMYELIA AND CHRONIC POLIOMYELITIS. [Policlinico, December 1920, XXVII, No. 12.]

A pathological study of a case of Aran-Duchenne muscular atrophy. The necropsy findings after forty years demonstrated that such cases should not be diagnosed pseudosyringomyelia but were sclerotic myelitis forms of chronic poliomyelitis.

Girotti. SYRINGOMYELIA. [Riforma Medica, September 1921, XXXVII, N. 39.]

In Girotti's case the syringomyelia had been developing in a mild form for two years in the man of thirty-four when a trauma affecting the cervical spine caused extreme and persisting aggravation.

Krohn, H. UNILATERAL SYRINGOMYELIA. [Norsk. Magazin for Laege., September 1921, LXXXII, No. 9.]

This is a clinical report of a case of mild unilateral syringomyelia in a man of fifty-seven. Considerable improvement is attributed to rest, massage, and baths and roentgen exposure.

Koopmans, R. A. ARTHROPATHY UNDER THE INFLUENCE OF SYRINGOMYELIA. [Nederlandsch Tijdschrift voor Geneeskunde, August 13, 1921, LXV, H2, p. 822 (7 figs.).]

Syringomyelic arthropathy occurs oftener in males and chiefly in middle age; but it may occur as early as nine years and as late as seventy-eight; it may be present before any sensory changes or muscular atrophies have appeared. The shoulder joint is specially vulnerable, and it may be repeatedly dislocated. Trauma usually precedes the arthropathy, sometimes by only a very short period; and an existing arthropathy is made worse by a fresh trauma. Charcot postulated trophic centers in the ventral horn grey matter; their damage or destruction should thus give the joint changes. By others the neuropathic arthropathies are regarded as merely an arthritis deformans that by means especially of the sensory disturbances leads to the severe joint-deformities. Of late, degeneration of peripheral nerves has been blamed. In tabes and syringomyelia the nervous lesions destroy the protective influences which normally shield effectually from damage. While in the

early stages an arthritis deformans may be very difficult to diagnose from a tabetic or a syringomyelic arthropathy, we see that in the latter there is usually no pain on movement of the joint, whereas in the former disease the pain is severe. Koopmans records three cases of syringomyelic arthropathy: In case one, a youth of eighteen, there was sudden cracking of left shoulder, which increased in circumference with consequent limitation of its movement. For some years his left wrist had been swollen, and he has often had sores and wounds on both hands which quickly healed painlessly. An X-ray examination showed a spontaneous fracture of bone in the epiphyseal line (epiphysiolysis). In the second case there had been vague rheumatic pains for years; after a slight infectious illness his left arm was almost useless and he had great swelling of his left shoulder, from which much yellow fluid was evacuated; this was regarded as tuberculosis of the shoulder joint with periarticular extension; signs of syringomyelia were evident. In the third case the earliest signs were clumsiness and deformity of one elbow, with limitation of movement. Koopmans says that syringomyelia should be thought of in cases of arthritis deformans in early life. Sometimes the arthropathy is an early sign of syringomyelia. In cases of repeated dislocations of the shoulder joint syringomyelia may be the underlying cause. The prognosis is relatively favorable so far as the joint-function is concerned.

In about 25 per cent of the patients with syringomyelia these affections of the joints may be found, so that it is not a rare one. The male sex on the average is to be preferred. The joint disturbance may be present, before any other symptom of syringomyelia, and recurrent luxation of the shoulder may be the first trouble. In most cases it seems that the first symptoms have been preceded by a trauma; and it is sure that an existing arthropathy can be impaired by new insults. Many theories have been composed to explain the connection of the joint disturbances and the disease of the nervous system. By the degeneration of topic nerfs and vasomotors, the feeding of the joints suffers; and protecting qualities have been eliminated by the disease of the sensible nerfs so that the joints have to suffer of more frequent and heavier insults than normal joints. This must be of a great influence on the cause and the progress of the arthropathy.

It is of importance that, especially by French investigators, the arthritis deformans is considered as a nervous disease of the joints. There exist no specific pathological differences between arthritis deformans and joint disturbances of tabes dorsalis and syringomyelia: there is alone a difference in "degree." But even when it might be true that neuropathic arthropathies are only common arthritides of neuropathic individuals, it remains of practical use to distinguish them from other diseases of joints, especially from arthritis deformans.

Meeting particular forms of joint disturbances, it has to be thought at the possibility of arthropathy at syringomyelia. Of course, a complete clinical research is wanted to make the right diagnosis, and the X-ray

plate may be of great value. The three cases show the difficulties of the diagnosis and the Roentgenological findings. [Author's abstract and L. J. Kidd.]

de Villaverde, J. M. SYRINGOMYELIA IN CHILDREN. [Archives Españoles de Pediatría, June 1921, V, No. 6. J. A. M. A.]

De Villaverde comments on the rarity of syringomyelia in children without other manifest developmental defects. He adds, however, that cavities are sometimes found in the spinal cord of children dying from other diseases, and they may have had unsuspected syringomyelia. This may have been the explanation in certain cases of atrophy of muscles without known cause. The diagnosis of syringomyelia is difficult in children. In one case described, in a girl of fifteen, the first symptoms had been noted at thirteen and one-half: pains in the left wrist assumed to be of rheumatic origin. They subsided in a few weeks but returned several months later, and persisted, with pain also in the hand and forearm, aggravated by moving the hand, and the hand grew weak and thin. A few months later the other hand developed the same set of symptoms, but less pronounced. The legs and sphincters were normal. Roentgenography showed decalcification of the bones of the carpus. Sedatives to relieve the pain and electricity to arrest the atrophy of the muscles failed to check the progress of the disease. He gives some charts showing the gradual extension of the sensory disturbances. The appearance of an isolated symptom and its persistence and the gradual sequence of symptoms should suggest the possibility of this disease.. He queries whether syringomyelia is responsible in another case, in a girl of twelve, who for three years has had periods of pains extending the entire length of the left arm from spine to finger tips, and sometimes, less severe, in the right arm. The pains disappear for months at a time, but then return as severe as ever. The child seems in excellent health and normal otherwise, and there is no tenderness along the spine or elsewhere. The motor disturbances are progressive with syringomyelia, while they are stationary when poliomyelitis is responsible for them, and there are no sensory disturbances. With polyneuritis the paralysis retrogresses more rapidly and completely than in the syringomyelia cases, while the sensory disturbances differ from those of syringomyelia, in which, besides, the course is progressive.

Carp, E. A. D. E. SYRINGOBULBIA. [Nederlandsch Tijdschr. voor Geneeskunde, LXVI, June 10, 1922, 2239 (2 figs.).]

Syringobulbia differs, as a rule, from syringomyelia in two particulars: owing to the large number of tracts and nuclei that are involved, even a small focus may give a clinical symptomatology that varies according to the anatomical parts it attacks; and there is a predisposition to the formation of fissures and clefts, while cavity formation is much rarer than in syringomyelia. Usually the fissure has a definite

course and extends in its lower part from the medial to the latero-dorsal region, while higher up it goes from the medio-dorsal to the latero-ventral, so that it takes a kind of screw-rotation course. The fissure becomes smaller as it ascends, and in almost all cases ends about the middle of the pons. The interruption of the sensory paths from the nuclei of Goll and of Burdach, which pass into the median fillet and *formatio reticularis* and have a perpendicular position to the direction of the fissure, together with loss of fibers in the *radix spinalis trigemini* and damage to the hypoglossal nucleus and the vago-glossopharyngeal root and nuclei, as well as to the *accessorius* fibers, gives rise to unilateral sensory disturbances with the syndromes of Avellis, Schmidt, and Jackson, characterized by unilateral palsy of palate, pharynx, larynx, sternomastoid and part of the trapezius muscles, and the tongue muscles. Carp records two cases of syringobulbia in women, aged thirty-two and thirty-nine, respectively. The first showed loss of all sensory qualities on left side of body and face, with a slighter involvement of the extremities of the right limbs; there was rotatory nystagmus which increased on looking to the more affected side, sensory changes in the right maxillary area, bilateral deafness of central origin, paralysis of left pharynx and palate with bilateral laryngeal (*posticus*) palsy and gustatory disturbances, attacks of oppression, dysphagia, and a doubtful atrophy of the tongue. Evidence of a left-sided pyramidal motor disturbance was also present, *viz.*, increased tonus, diminished power, and diminished left abdominal reflex. The long, gradual course was against a neoplasm; the existence of an occlusion of the posterior inferior cerebellar artery was improbable, for the affection usually shows an acute apoplectiform onset and, later, at least a partial regression of symptoms. There was also no evidence of multiple sclerosis. In the second case there was loss of superficial and of pain and thermal sensibility mainly on the left side of the body and face, rotatory nystagmus on looking to left, dysphagia, left-sided taste disturbances and laryngeal (*posticus*) palsy, atrophy of the small hand-muscles mainly on left, with trophic disturbances (*adiposity* and facial asymmetry). The disease began with atrophy of hand-muscles with severe pains in (mainly) the left arm and also left side of body. In the face the sensory changes were of the radicular type, merely a zone around eye, part of the chin and cheek being left free. The disease-process began here, probably in the cervical spinal cord, slowly ascended and then gave a lesion of the distal part of the left nucleus ambiguus: this produced the *posticus* palsy. There was also a loss of vago-glossopharyngeal fibers of the *tractus solitarius* which gave the gustatory changes and the left-sided sensory loss in the mouth. The escape of the zone in the face around the mouth to the lateral side of the palpebral fissure points to the involvement of mainly the caudal part of the spinal trigeminus root. The general sensory involvement is attributable to damage to the fibers in the median fillet and *formatio reticularis*, and arcuate fibers, while the

right spinothalamic tract has especially suffered. In both of Carp's cases there was a rotatory nystagmus which increased on looking to the more affected side. This form of nystagmus has often been seen in syringobulbia. [Leonard J. Kidd, London, England.]

Lhermitte. X-RAY TREATMENT OF SYRINGOMYELIA. [Paris méd., October 1, 1921.]

This author has been using this method now for several years. In this communication he remarks that since the beginning of the nineteenth century, when Ollivier of Angiers first described the disease, until quite recently, the prognosis of syringomyelia has been persistently bad and the treatment ineffective. The application of X-rays, however, has caused a considerable modification of its almost invariably fatal course. In 1905 Raymond, Oberthür, and Delherm incidentally noted cases of improvement in syringomyelia effected by X-rays, but Gramegna in 1907 was the first to make a complete study of the effects of radiotherapy on syringomyelia, and shortly afterwards a successful case was reported by Lhermitte and Beauregard. The painful symptoms of syringomyelia, as might be expected owing to the general analgesic effect of X-rays, are those which yield most readily to the treatment. The objective symptoms are more resistant. The paretic symptoms due to compression or circulatory disturbances in the pyramidal tract are, as a rule, benefited at the same time as the sensory symptoms. Walking becomes easier, and especially in cervicodorsal syringomyelia, the patients feel a return of power in their upper limbs and greater freedom in the movement of their fingers. Attenuation of the spastic phenomena in the upper and lower limbs may also occur. On the other hand, muscular atrophy and the vicious attitudes caused thereby are not affected, and all that can be expected from radiotherapy is the arrest of the regularly progressive evolution of the amyotrophy. Trophic disorders in the skin, bones, and joints as well as vesical and genital disorders, are also benefited by X-ray treatment.

Meuwissen, H. SYRINGOMYELIA WITH SKELETAL CHANGES AND AUTOPHAGISM. [Nederl. Tijdschr. voor Geneeskunde, November 19, 1921, LXV, 2545 (4 figs.).]

Meuwissen records a case of syringomyelia, with skeletal changes in a single woman of fifty-one, who had a peculiar habit of nibbling off pieces of skin from her insensitive left hand and then swallowing them. There was marked atrophy of her shoulder-girdle muscles; the right hand was in the "claw-position," with great atrophy of its small muscles, and there were fibrillary contractions in the muscles of the right forearm and hand. Pain- and temperature-sensibility were lost over most of the chest and abdomen and along the ulnar halves of both arms, forearms, and hands. Tactile and deep sensibility, normal. The skin-nibbling was confined to the left hand. This went on very slowly over

fifteen years; ultimately the left hand showed loss of the terminal phalanges of the ring finger, and of all the phalanges of the first, second, third, and fifth fingers which the patient had nibbled off, munched up, and swallowed. [Leonard J. Kidd, London, England.]

Vitrac, J., Verger, H., and Piéchaud, F. A CASE OF SYRINGOMYELIA WITH ARTHROPATHIC SYMPTOMATOLOGY. [Gaz. Hebd. des Sci. Méd. de Bordeaux, August 28, 1921, XLII, p. 416.]

The writers report a case of syringomyelia with arthropathic symptomatology in a healthy outdoor worker of forty-seven. At eighteen, he had recurring attacks of very abrupt, sharp, lancinating pains in his right upper limb, not specially in the joints, so that he had to stop his work for a few minutes. The pains continued for two years, and then his right hand showed the typical painless hypertrophic joint lesions and exostoses of neuropathic arthritis. The deformity of the hand increased steadily over many years, and ulcers appeared on the palmar surface. At first leprosy was considered, but apart from the fissures on the hand there was no characteristic leprosy ulceration, no swelling of the ulnar nerve, and no Hansen's bacilli. About eight years after the onset, signs of syringomyelia slowly developed, with atrophy of periscapular muscles, and analgesia and thermoanesthesia of the whole right upper limb and part of the right neck and thorax. In connection with the pains at the onset of this case, the writers point out that the coexistence of hypertrophic cervical pachymeningitis and syringomyelia is fairly frequent. [Leonard J. Kidd, London, England.]

Pettit. THE INFECTIOUS NATURE OF DISSEMINATED SCLEROSIS. [C. r. Soc. Biol., April 29, 1922.]

The conception of the infectious nature of disseminated sclerosis, first put forward by Marie, has had much in favor of it of late. In addition to evidence previously adduced in its favor, Pettit now records some very convincing facts which lead him to conclude that the origin of the disease is due to the activity of a spirochetal organism which is found in the cerebrospinal fluid of patients during life. Four cases of the disease were studied, and from the spinal fluid of each it was possible to infect either monkeys, guinea-pigs, or rabbits, and to demonstrate the presence of the spirochete in the cerebrospinal fluid after some days. In the case of the first patient the cerebrospinal fluid was withdrawn and injected intrathecally into a monkey. After presenting motor disturbances and paralytic disorders of the posterior limbs the animal died in twelve days. The blood, the cerebrospinal fluid, and the spinal cord all proved infective to rabbits, on which five successful passages were performed. The spinal fluid of the same patient was also injected into several rabbits and guinea-pigs; some of the former animals died, while all the guinea-pigs survived, but without exception they were all shown to contain the peculiar spirochete in the cerebrospinal

fluid during life. The same results occurred in the other three patients from whom rabbits were infected. Until a greater amount of knowledge has been gathered in respect to the general properties of the organism, the author considers any attempt at nomenclature to be somewhat premature.

Birley, J. L., and Dudgeon, L. S. A CLINICAL AND EXPERIMENTAL CONTRIBUTION TO THE PATHOGENESIS OF DISSEMINATED SCLEROSIS. [Brain, 1921, XLIV, 150.]

The investigations with which this paper deals were begun in the autumn of 1913 and resumed in 1920 after an interruption of five years caused by the war. Thirty-five cases were investigated clinically and bacteriologically, while animal inoculations were carried out in fifteen instances, in two cases with material obtained post mortem. The authors lay stress on the fact that the disease in only 14.3 per cent of their cases ran a chronic progressive course. In more than half of the cases the onset was comparatively sudden, in 68.6 per cent some of the symptoms came on acutely, while in 85.7 per cent the disease ran a remarkably discontinuous course, the symptoms pointing now to this and now to that locality of the brain or cord, appearing in an irregular and haphazard manner and at greatly varying intervals of time. In view of the general tendency towards recovery from the more acute symptoms together with the long remissions which many patients enjoy extending over several years, it seems quite possible that more cases than is commonly supposed recover from their early lesions and remain well permanently. As regards symptomatology, attention is directed to the frequency of paresthesia (82.6 per cent) and disturbances of deep sensation (65.7 per cent) especially vibration, both of which are to be regarded as evidences of pathological changes in the posterior columns of the cord; disturbances of cutaneous sensibility were present in less than a third of the cases. Involvement of the pyramidal tracts as shown by an extensor plantar response was present in 91.4 per cent, while the abdominal reflexes were absent in 77.1 per cent. Nystagmus was present in 74.3 per cent, cerebellar incoördination of the legs in 51.4 per cent, and of the arms 42.6 per cent, whereas articulation was disturbed in only 28.6 per cent of the cases. Actual spastic paraplegia was found in less than half the cases. The visual apparatus was frequently involved; pallor of one or of both discs was present in 57.6 per cent, diplopia in 34.3 per cent, sudden amaurosis (retrobulbar neuritis) in 20 per cent, while severe bilateral failure of vision was present in only 8.6 per cent of the cases. There were twice as many females as males, and the average age of onset was 24½ years.

Histological examination of the brain and cord in one case which came to autopsy revealed, in addition to numerous areas of sclerosis, perivascular infiltration with round cells and endothelial cells. Similar evidence of the inflammatory nature of the disease has already been

noted in the exhaustive histological studies published by Seimerling and Raecke in Germany, and by Dawson in Scotland. The cerebrospinal fluids of the patients were examined by various methods. In only one case was there any excess of lymphocytes, and only four cases gave positive globulin reactions. The Wassermann reaction was negative in every case both in the blood and C. S. F.

Anaerobic cultivations were carried out in 27 cases, and aerobic in 19. A long-chained streptococcus was cultivated from the C. S. F., and cerebral tissues after death in one patient who had been in a profoundly septic condition for the last six weeks of her life. A similar organism was cultivated from the C. S. F. of another nonseptic case, cultures of which on intracerebral injection into rabbits caused death with the formation of frontal abscesses. The authors, however, are by no means inclined to regard these findings as of any direct significance with reference to the pathogenesis of the disease. In all other respects the cultures were sterile.

In spite of the variety of routes employed for animal inoculations (intracerebral, spinal, sciatic, peritoneal, testicular), the authors failed to produce in rabbits any condition of ill-health, with the exception of a transient stiffness of the hind legs in two animals, by inoculating them with fresh C. S. F. and blood serum of patients suffering from disseminated sclerosis, or by inoculating them with fresh filtered suspensions of the brain or cord of patients recently dead of the disease. The recent experimental work is critically reviewed, and the authors point out that even if it is admitted that some investigators have transmitted a disease to animals there is an entire absence (with the possible exception of Steiner's monkey experiment) of histological proof that the disease so transmitted was disseminated sclerosis. They are further of opinion that the evidence in favor of the assumption that the pathogenic agent is a spirochete is incomplete.

Strong reasons are advanced for discarding Müller's endogenous theory as to the nature of the disease. The clinical course with its exacerbations and remissions together with the histological picture cannot be explained on any endogenous basis, whereas both are readily intelligible provided one assumes the presence of a morbid agent acting with varying degrees of intensity over considerable periods of time; and since variations in intensity are characteristic of all inflammatory and infective processes, such an assumption is practically equivalent to postulating an inflammatory lesion as the essential morbid process underlying the disease. The authors further consider it probable that the virus lies latent in the scar tissue (sclerotic areas), but capable of initiating further infection when the local and general conditions permit; in other words, they regard the scar tissue as the starting point from which reinfection originates. [Authors' abstract.]

Editorial. PATHOGENESIS OF DISSEMINATED SCLEROSIS. [B. M. J.]

Dr. Birley and Professor Dudgeon's clinical and experimental contribution to the pathogenesis of disseminated sclerosis is singularly complete and interesting, for in addition to its record of careful bedside and laboratory investigation it reviews the recent work on this difficult subject and criticizes the view that the disease is due to spirochetal infection, not only in the light of their own negative results but also on other grounds. For example, Dr. D. K. Adams' contention, based on a colloidal gold luetic or paretic reaction of the cerebrospinal fluid in 95 per cent of his cases, is met by the objection that until the rationale of this reaction is more fully understood, arguments depending on its presence and behavior are unsubstantial. Their own results, obtained from bacteriological examination of 35 cases, in 15 of which animal inoculations were carried out, in two instances from post mortem material, did not throw any light on the pathogeny, for no specific microorganism was isolated, and attempts to transmit the disease by inoculation of cerebrospinal fluid and other material from man to rabbits failed. That the disease has—as W. E. Bullock (now W. E. Gye), Siemerling and Raecke, Kuhn and Steiner, Simons, Marinesco, and others claim—been thus transmitted, is regarded as unproved; for even if it be admitted that a disease is conveyed, there is a complete absence of histological proof that the disease thus transmitted is disseminated sclerosis. Rather appropriately, the next paper in this number of *Brain* is on an experimental study of disseminated sclerosis by Dr. W. E. Gye, based on the injection of 129 rabbits and 15 guinea-pigs with cerebrospinal fluid from 21 patients with disseminated sclerosis; 17 of the rabbits but none of the guinea-pigs became paralyzed. This infrequency of positive results, which has been the experience also of other workers, is explained on the assumption that the organism, if there be one, is not constantly present in the cerebrospinal fluid, and never in large numbers. Dr. Gye admits that the necessary control experiments, namely, the inoculation of a large number—such as 100—of rabbits with the cerebrospinal fluid of persons certainly not suffering from disseminated sclerosis, have not yet been carried out, but he concludes that disseminated sclerosis is probably an infective disease, and that the virus may sometimes be found in the cerebrospinal fluid.

Dr. Birley and Professor Dudgeon dismiss the endogenous explanation of the disease, namely, that it is due to some development or congenital defect of the neuroglia, which is thus more liable than normal tissue to be affected by irritation—in other words, that the disease is a primary gliosis—as incompatible with its sudden exacerbations and long remissions. On the other hand, the exogenous hypothesis is quite compatible with the discontinuous clinical course of a disease due to the presence of a morbid agent acting with varying degrees of intensity over a considerable period of time. The clinical and histological evidence is regarded as overwhelmingly in favor of the view that the

morbid process underlying the disease is inflammatory in nature. The absence of cytological and chemical changes in the cerebrospinal fluid does not seriously militate against this conclusion, for, in the first place, such changes depend on meningeal lesions rather than on reactions of the nervous parenchyma, and, in the second place, alterations in the cerebrospinal fluid may be conspicuously absent in such frankly inflammatory conditions as acute poliomyelitis and encephalitis lethargica.

The clinical analysis of the 35 cases, for which presumably Dr. Birley is responsible, brings out some interesting points. Accurate diagnosis is particularly essential in cases used for experimental investigation, otherwise fallacies may arise from utilizing cases really of cerebrospinal syphilis, for these two conditions differ from others in presenting evidence of widely separated lesions of the central nervous system. The disease is one of healthy young adults, and in the large majority of cases is characterized by an intermittent course with a hazardous series of relatively acute disturbances due to focal lesions distributed at random, both in the brain and spinal cord, appearing at irregular intervals, and in their early stages showing a general tendency to improvement, so that the possibility of spontaneous cure cannot be entirely denied. In a small proportion of the cases—5 out of the authors' 35 cases—the disease runs a chronic progressive course from the outset; but these two clinical forms are manifestations of the same disease. They are not the results of distinct pathological processes, as was argued by Müller, who sought to confuse the subject by making the unwarranted suggestion that the chronic progressive form, originally described by Charcot, was the only true disseminated sclerosis, and was due to external factors acting on a congenitally vulnerable neuroglia, whereas the commoner discontinuous form was a different disease, for which he proposed the somewhat similar name, disseminated encephalomyelitis.

Powers, H. POSTDIPHTHERITIC DISSEMINATED MYELITIS. [Boston Med. and Surg. Jour., January 12, 1922, CLXXXVI, No. 2. J. A. M. A.]

Disseminated myelitis or sclerosis following diphtheria is reported only seven times in the literature. Powers adds one case: the only one in which antitoxin was given. The picture of disseminated myelitis was complete, but apparently in this case, myelitis has not terminated in sclerosis. The patient made a complete recovery.

Wernicke, O. MULTIPLE SCLEROSIS, MYOPIA AND DIABETES. [Semana Medica, Buenos Aires, July 1921, XXVIII, No. 30.]

In this interesting clinical paper the author shows that pernicious myopia, as well as glaucoma, may be due to a multiple sclerotic process. All the nervous disturbances observed in diabetes are evident likewise

in multiple sclerosis. The latter may be capable of inducing glycosuria by way of the nervous system, liver, pancreas, etc. (as Lewy has demonstrated). The foci of multiple sclerosis seems to spread by way of the blood. Hence the disease does not necessarily begin in the brain, and foci are liable to develop elsewhere. The probability of becoming involved is greater the larger the organ, but the symptoms therefrom depend on the function and on the sensitiveness to pain. There is much to sustain the assumption that such foci may be responsible for chronic muscular and joint rheumatism, as he explains; the foci here making their presence felt early by the pain induced in these more sensitive regions. Inability to stand cold is common to both rheumatism and disseminated sclerosis.

Söderbergh, A. ABDOMINAL REFLEXES IN MULTIPLE SCLEROSIS. [Acta Medica Scand., June 1921, LV, No. 3.]

In this clinical contribution on 26 cases of multiple sclerosis the author reports that the abdominal reflexes were completely abolished in 10, and they were all present in 2. In 14 the abdominal reflexes were found variable at different times. The course of the disease ran in some manner parallel with the changes in the reflexes of the abdominal segments.

Parry, E. J., and Williamson, O. K. CEREBROSPINAL FLUID IN DISSEMINATED SCLEROSIS. [Lancet, February 26, 1921. J. A. M. A.]

It is held by Adams that the cerebrospinal fluid picture in disseminated sclerosis is as follows: a normal cell count, a negative Wassermann reaction, a syphilitic or paretic reaction to colloidal gold, and in most cases (83 per cent) a normal protein content. The absence of a positive Wassermann reaction in the great majority of cases and the absence of pleocytosis are in accordance with the view that this disease is not of syphilitic origin. On the supposition that the origin might be spirochetal treatment was carried out by spirocheticidal drugs. In practically every case under treatment modifications toward a negative result of the colloidal gold reaction were noted. As regards clinical effects of such treatment, no improvement resulted in advanced cases of the disease, but prolonged treatment produced amelioration of early cases, and in one or two instances the results were marked. With reference to early diagnosis, emphasis is laid on the evidence of the cerebrospinal fluid picture and the absence of the abdominal reflex.

Fischer, B. THE PERIPHERAL AND CENTRAL VESTIBULAR APPARATUS IN MULTIPLE SCLEROSIS. [Zeitschr. f. d. ges. Neur. und Psych., Vol. LXXVI, Nos. 1, 2.]

The author reports the results of extensive investigations in 69 cases of multiple sclerosis. In 67 per cent there was found a nystagmus of

vestibular character. This was usually horizontal and rotatory, often in combination with a vertical nystagmus, and there were also very often changes in its direction. Nystagmus appeared more often toward the right and above. In 28 per cent of the cases there was pointing beyond the mark but this was usually only temporary. This showed rather relations to adiadochokinesia than to ataxia and intention tremor. Complaint was frequent of feelings of dizziness. Such complaints of dizziness and of a feeling of illness are not uncommon in test of experimental nystagmus. The experimental reactions of pointing, falling and caloric reactions were normal in most cases although in a third of the cases the caloric nystagmus was stronger than usual. Sixty-seven per cent of the cases showed Romberg's sign. Paralysis of the eye muscles was evident in 58 per cent. [J.]

Trabaud. ENCEPHALITIS LETHARGICA IN THE FORM OF MULTIPLE SCLEROSIS.

In the course of an epidemic of encephalitis lethargica which appeared during the year 1921 in the occupied German provinces a number of cases were observed in the French troops of the army of the Rhine. All the forms of the disease described in the world's literature have been successively recognized as regards the classic forms described by Economo of Vienna up to the myoclonic and Parkinsonian forms well studied in France. From the beginning we have thought that epidemic encephalitis, of which the pathological anatomical characteristic is the attack of the cerebral nervous system in islets, can simulate multiple sclerosis. We were not long in making typical observations as follows: Captain T. entered the hospital at Mayence for general fatigue. He had been ill for several days experiencing continually an unconquerable tendency to sleep. The temperature sometimes reached 39° to 40°. The examination revealed gingivitis, redness of the membrane of the palate and of the throat and copious salivation. The muscles of the lips, of the chin and of the tongue were affected with a continuous light tremor. Speech was spluttering and difficult to understand. No ocular paralysis but bilateral miosis and nystagmus in the horizontal movements of the eyeballs. The hands trembled especially during intentional movements. The finger attempting to touch the tip of the nose when the eyes were closed trembled from beginning to end of the movement and missed. The tendon reflexes of the upper extremities were normal, the patellar reflexes very active. Patellar clonus on both sides. Achilles reflex very marked, sign of the fan. Lungs were normal, pulse 156. Oculocardiac reflex causes it to fall to 82 beats. Lumbar puncture gives a clear liquid which contains no lymphocytes of the cell of Nageotte but which contains 0 gr. F 1 of glucose per liter. Wassermann negative. Patient was treated with urotropin and fixation abscess.

4. PONS, MEDULLA, MIDBRAIN, EPIDEMIC ENCEPHALITIS.

Nixon, Charles E., and Sweetser, Theodore H. A REPORT OF AN EPIDEMIC WITH CERTAIN CASES PRESENTING THE PICTURE OF MENINGO-ENCEPHALITIS. [Amer. Jour. Med. Sci., June 1921, Vol. CIXI, No. 6, p. 845.]

The paper is a report of a series of cases occurring in a village in southwestern Minnesota. From the standpoint of symptomatology the cases fell into three groups; the first group presented the syndrome of an acute toxic condition; the second group that of meningitis or meningo-encephalitis, and the third group the clinical and pathological findings of an epidemic encephalitis. There was a definite diminution of acuteness in the latter cases and there was an evident contagiousness present in the whole group of cases, for out of eleven cases, five were in two related families; of the other six there were three in one family and two in another family. Six of the eleven patients died. There were three autopsies and two of the brains were examined microscopically. These brains showed the lesions that had been regarded as characteristic of epidemic encephalitis. [Authors' abstract.]

Piticariu, I. TREATMENT OF POSTENCEPHALITIC MYOCLONIAS AND PARKINSONISM BY INTRAVENOUS INJECTION OF THE PATIENT'S CEREBROSPINAL FLUID. [Wiener klin. Wochschr., XXXV, May 11, 1922, p. 441.]

Piticariu has had good results in myoclonias and Parkinsonism occurring after epidemic encephalitis by intravenous injections of the patient's cerebrospinal fluid. He draws off 10 cm.c of the spinal fluid and injects it at once into the patient's ulnar vein. The injections are repeated at intervals of five to seven days; in the slighter cases four injections are enough, in the severer seven are needed. A man of twenty-six had, three months after an attack of lethargic encephalitis, severe myoclonias of his right limbs, of considerable amplitude (up to 26 shocks in a minute). After five injections of his own cerebrospinal fluid in the course of three weeks his myoclonia entirely disappeared. In another case, a man of twenty-two, still greater myoclonia showed great improvement in a month's course of five injections. In a boy of sixteen, whose acute encephalitic attack had ended, rigidity of the whole body appeared, with tremor of the extremities, disturbances of equilibration, and propulsion and retropulsion; the Wassermann reaction was negative in the blood and the cerebrospinal fluid. After seven injections of his own cerebrospinal fluid his symptoms disappeared entirely, with the exception of the rigidity, which had, however, greatly diminished. Lumbar puncture alone can hardly explain the striking benefit from this method of intravenous injections of the patient's spinal fluid, for of itself it does not usually give any marked therapeutic effect in cases of lethargic encephalitis. [Leonard J. Kidd, London, England.]

Agnello, F. POST-ENCEPHALITIC BLINDNESS WITHOUT LESION OF FUNDUS. [II Morgagni, May 5, 1922.]

This clinical paper discusses the frequency of ophthalmoplegia and of optic nerve lesions recorded in the recent epidemic. The visual disturbances range from slight amblyopia to total blindness, and in a certain number edema and congestion of the papilla or pallor with signs of commencing optic atrophy were found. Treatment was of little use. He describes the case of a girl of thirteen whose family history was negative. She had had measles and eczema, and several attacks of tonsillitis. Menstruation commenced at the age of twelve with hysterical symptoms and some irregularity of menorrhagia. Her illness began on February 16th, with sudden onset of fever (39.8° to 40.5° C.), intestinal symptoms followed by bronchopneumonia lasting eight days and running a normal course. On February 27th encephalitis supervened with return of fever (38.5° to 39.5° C.), lethargy, ptosis, and strabismus. When the temperature commenced to fall she complained of her eyes, and from the beginning of convalescence she was quite blind. When seen by the author the ptosis and squint had disappeared, but there was slight nystagmus. The pupils were of normal size and reacted promptly to light. The discs and vessels were normal in color and size, the retinae were normal and media quite clear. The patient could not recognize any objects, and said she was quite blind. Agnello states that Vincent has recorded similar cases with no obvious changes in fundi and preservation of light-reflex. He excludes uremia and lead poisoning, and suggests that the lesion in this case was in the subcortical white matter of the occipital lobes.

Petit, G. PROTRACTED EPIDEMIC ENCEPHALITIS. [Bull. de la Soc. Méd. de Hôp., April 28, 1921, XLV, No. 13.]

The mental syndromes of epidemic encephalitis often run a very various course. In two women with protracted type and in one young man, various psychopathic syndromes lasted for over a year, either continuous or with intermissions (acute, delirium, mental confusion, hallucinations, extreme dread, morbid impulses and phobias, etc.). The organic signs which accompanied the mental syndromy established the diagnosis.

Pilotti. THE PATHOGENESIS OF MYOCLONUS. [II Policlinico, April 1, 1921.]

This author here describes the clinical syndromy in a fatal case in a woman aged thirty-seven. The pathogenesis of myoclonus he holds is still obscure in spite of the anatomical lesions, whether found in the cortex, the spinal cord, or the basal ganglia. As a general rule cases of myoclonus, whether they have a chronic course like Pilotti's patient and a few similar ones which have been studied histologically, or an acute course like the cases of epidemic encephalitis of the myoclonic type,

present as a rule too great a complexity, both in their clinical and histological manifestations, to allow one to distinguish with certainty those lesions which are alone responsible for the motor disturbances from those which have nothing to do with them. Pilotti is of opinion that the origin of the myoclonic movements is not confined to a single area such as the cortex, spinal cord, or midbrain, but that in addition to myoclonic movements which are undoubtedly of cortical origin, other lesions in the cord or midbrain may cause these motor disturbances by a hitherto unexplained mechanism.

Mourgue, R. TORSION SPASM FOLLOWING LETHARGIC ENCEPHALITIS.
[Gaz. Hebd. des Sci. Méd. de Bordeaux, XLIII, May 28, 1922, p. 254
(2 figs.).]

Mourgue describes his case as a typical one of Th. Ziehen's torsion-dystonia, and says it is the first one that has followed on lethargic encephalitis. No similar case is known in the patient's family. In 1919 a man, during an influenza epidemic, had profuse sweating with severe headache, but no fever; he had also an attack of dreamy delirium, and showed continuous psychomotor agitation. He had slight strabismus, intolerable itching of skin, profuse sweats, and continuous extension of the right upper arm and an unbearable pain in it. About the fifth day his temperature was over 40° C., and the agitation and narcolepsy disappeared. He now became so inert, and his breathing was on many occasions such that he was believed to be dead. Under autoserotherapy he improved temporarily. He was fed with difficulty, owing to extreme dysphagia, which lasted throughout the fifteen days of the acute stage. Soon he had an attack of mania, with great exaltation. In about a month from the onset of his acute illness his peculiar motor state developed; he had a pseudoptosis, and could not open his eyelids except with his fingers. The motor state has lasted quite eighteen months. When he is sitting there is seen about every eight seconds an abrupt movement of the left arm on its axis from within outwards while the head is carried backwards and rotated to left. The same thing occurs at intervals while he stands erect, and his fingers are flexed on the palm; the right arm is retracted backwards and slightly adducted; the right foot is slightly extended and shows slight varus. At each torsion-spasm of the left arm the head goes backwards and there is a lumbar lordosis; the trunk also shows a slight torsion-movement on its axis from left to right, with a vertebral curve to right. He cannot stand on right foot, and only badly on left. During the left arm's spasm there is a facial grin from slight contracture of peribuccal muscles. Right scapular muscles markedly atrophic; very slight atrophy in right arm and forearm muscles. Hypertrophy of right sternomastoid. During the intervals between the spasms there is marked hypotonia of both upper limbs but especially of right. On application of Kohnstamm's katatonus-procedure a positive result is obtained: there is fixation-rigidity for some seconds.

Once after a tiring walk patient showed a veritable fixation-rigidity in his feet. In a prolonged walk his respiration becomes panting. In dorsal decubitus there is a marked hypotonia of both arms, but less of the legs, but now there is no torsion-spasm of left arm and no flexion of fingers. In lateral decubitus the right arm is forcibly carried backwards and extremely adducted, as in the erect position. In ventral decubitus a remarkable development of the right erector sphinx group of muscles is seen. On beginning to walk the hypotonia of the right upper limb, which is suddenly carried backwards in forced adduction, gives place to excessive hypertonia; the right thumb is now in abduction, the other fingers strongly flexed, and the right hand pronated. The right lower limb is in hyperextension, and the right foot in equinovarus; simultaneously the head goes into opisthotonos and rotates slightly to left; the vertebral column shows torsion from left to right; the neck-muscles become hypertonic. The right sternomastoid, already hypertrophied, stands out strongly when he walks. When he walks on all fours there is a complete disappearance of lordosis and scoliosis and almost complete of torsion-movement also, but the erector spinæ's contracture persists. On the right side he has lost all active "movements of dexterity." Flexion of his fingers and supination and pronation are performed slowly. At a later date a right Babinski sign appeared, with loss of abdominal and epigastric reflexes. On forced looking to left there is horizontal nystagmus, but only the slow phase. Oculocardiac reflex is inverted (73 becomes 77). Normal sensibility to all forms, electrical reactions, deglutition, and phonation; no sphincter trouble. During sleep the fingers are forcibly flexed on palms. No tenderness over liver. Thyroid appears large. Lumbar puncture gives notable diminution of his motor symptoms, but the right Babinski sign remains. The only psychological symptoms found were the amnesia during the acute stage of the encephalitis, and his present general indifference as to his situation and his malady. Mourgue thinks this apathy may be due to a diminution of his "psychical tonus," originating in the basal ganglia. The general motor state corresponds in its essentials to the dystonia of Ziehen-Oppenheim. Only the right Babinski sign and the loss of abdominal reflexes point to a pyramidal tract lesion; otherwise the signs and symptoms indicate an extra-pyramidal lesion, especially one of the corpus striatum, accompanied probably by diffuse lesions. The position of head, trunk, and left limb, seen during locomotion corresponds closely to that seen in cases of decerebrate rigidity. [Leonard J. Kidd, London, England.]

Livet. OBESITY IN LETHARGIC ENCEPHALITIS. [Bull. et Mém. Soc. Méd. des Hôp. de Paris, May 12, 1921.]

Four cases of obesity following lethargic encephalitis are here described occurring in two men and two women. The hypophysis and possibly the thyroid and genital glands are implicated by the infective

process. Opothrapy should form part of the treatment of such types of lethargic encephalitis. Netter has said that obesity was not a frequent complication of lethargic encephalitis, as he had seen it in only three out of 150 cases of lethargic encephalitis whom he had kept under observation for a period varying from three months to three years.

Hess, O. SEQUELS OF EPIDEMIC ENCEPHALITIS. [Münch. med. Woch., April 1921, LXVIII, No. 13. J. A. M. A.]

Hess has recently reexamined 13 men and 4 women who had had epidemic encephalitis in 1919-1920. All 17 patients without exception still have complaints, some of which are serious. The most common complaints are in regard to diminished capacity for work, poor memory and weakened perceptive faculties. Many speak of lack of interest in things about them, noticeable to themselves and remarked upon by their friends. Others state that in the daytime they are sleepy and tired, fall asleep soon after retiring but are soon awake and are unable to get any restful sleep the balance of the night, the sleep they do get being apt to be disturbed by confused and horrid dreams. About 50 per cent have either continuous or intermittent headache, which is sometimes so severe as to preclude all work. Dizziness and a feeling resembling that of inebriation were mentioned by 6 patients. Some complain of neuralgic and rheumatic pains, various painful and unpleasant sensations marked by jerks and twitches of various muscles. A feeling of weakness in arms and legs, salivation, colorless speech, singultus and yawning were often present. A feeling of unsatiated hunger, together with an enormous appetite and marked, unnatural increase in weight, was noted in 4 cases. Changes affecting the sexual sphere were referred to by 5 patients. In most of the patients the phenomena were decreasing but in 2 they had been increasing of late. Bad weather, all patients stated, seemed to affect unfavorably both physical and mental symptoms. In almost all his patients he found to a greater or less degree changes in character, tendencies and forms of activity. Lack of will power and of energy is the rule. An undue seriousness characterizes many. A peculiar stiff bearing and lack of play of the features are common accompaniments of the altered character.

Kirby and Davis. PSYCHIATRIC ASPECTS OF EPIDEMIC ENCEPHALITIS. [Am. Arch. of Neur. and Psych., May 1921, V, No. 5. J. A. M. A.]

An analysis was made by Kirby and Davis of the psychiatric aspect of eighteen cases of epidemic encephalitis. The psychic disturbances of epidemic encephalitis present the general characteristics of an acute organic type of mental reaction, corresponding more specifically to a toxic-infectious psychosis. In the acute stages of the disease, psychic torpor and delirium are the most frequently observed mental disturbances, although other clinical pictures may be encountered, as the Korsakoff syndrome or more complex mental disorders in which various affective

and trend reactions give a special cast to the psychotic disturbance. Two types of sleep disturbance occur, hypersomnia and hyposomnia. The four gradations of the former are drowsiness, lethargy, stupor and coma. A great majority of patients with encephalitis show delirium at some stage. Transient delirious features during a stupor may easily be overlooked. In encephalitis, the content of the delirium tends to center about habitual trains of thought and occupational activities, but is sometimes determined by somatic sensations. Before the onset of lethargy or delirium, mood changes are usually not marked, although certain patients in retrospect have described a worried, anxious mood at this time; and in contrast, one patient at the onset, while insomniac and overactive, expressed grandiose ideas but was not apparently elated. After the passing of the lethargic or delirious phase, euphoria frequently arises and with it sometimes uncontrollable laughter with appropriate mood. Features of manic reaction are sometimes added to the euphoria and furnish a picture not distinguishable from a manic-depressive excitement. Depressive reactions in various grades of severity, not accompanied by retardation, although in one case with repeated suicidal attempts, have been seen following the stuporous or delirious stage. In the lethargic and stuporous states there is apathy and apparent in-affectivity. In all of the unrecovered patients there were signs of some definite alterations in character or mood. Psychic torpor and emotional apathy appear to be the most important mental factors in producing the stupor, while rigidity and certain other muscular symptoms, when present, seem rather to be the expression of a motor phenomenon of the sort seen in paralysis agitans. Ideas of a specific type are not found in encephalitis any more than in other organic-toxic-infectious mental disorders. In regard to the outcome of mental symptoms of epidemic encephalitis, Kirby and Davis have found much evidence of persisting emotional alteration with little evidence of organic mental defects or dementia.

Francioni. MENTAL SYNDROME OF EPIDEMIC ENCEPHALITIS. [II
Policlinico, April 25, 1921.]

This author describes a syndrome observed by him in about 20 children aged from two to thirteen years. More or less pronounced psychical changes were present in all. There was present either excessive irritability or violent behavior, or, on the other hand, apathy and lassitude, changes in affectivity shown by indifference to their parents, and changes in their general appearance. The intellectual faculties were less affected so that some of the children attended school. Only a few of the patients showed more pronounced psychical symptoms, such as an exaggerated motor restlessness, motor and verbal stereotypy, tendency to lying, or fugues. One child of six seemed nearly normal during the day but as night approached displayed psychic and motor agitation of such intensity that it could be compared only with a neurotic convulsion. In this and

some other cases the motor phenomena were restricted to one side of the body, and they appeared every night in the same form. In the intervals the body stiffened and curved backward, with stertorous breathing. These disturbances kept up all night. The child was conscious throughout, but babbled incoherently. The motor phenomena were not so pronounced when the child was kept sitting up or on his feet, but no distraction was able to ward off the development of the attacks at the same hour each night. The most important symptom, however, which was present in every case was the occurrence of insomnia. It was first of all noted that the slight psychical changes mentioned became more pronounced towards evening. When the children were put to bed they were quite unable to go to sleep, but remained in a state of psychical and motor restlessness until the early morning. Francioni emphasizes the fact that the condition was not really a disturbance of sleep, because when once the children succeeded in getting to sleep the sleep was long, deep and quiet. The other symptoms consisted in a moderate degree of loss of flesh, slight trophic changes in the skin and muscles, loss of appetite, vomiting, yawning, and sighing. The syndrome had a chronic course, and it was only after several months' observation that a slight improvement occurred. In some of the cases there was a history of a recent acute febrile disease with the characteristics of epidemic encephalitis, and Francioni thinks it probable that even where there was no such history the condition was due to the same cause, especially as most of his cases occurred at a time when epidemic encephalitis was prevalent. He states that Fiore had seen four similar cases in children aged three to twelve years at the Florence Pediatric Clinic. The syndromes were markedly chronic in character but a gradual improvement took place in most of the cases.

Turrettini and Piotrowski. EPIDEMIC ENCEPHALITIS. [Paris Médical, April 30, 1921, XI, No. 18.]

In this clinical paper a case of acute epidemic encephalitis in a young woman of six years of age is reported. It persisted for nine months with obstinate drowsiness, hypertonus and trismus. Ocular signs were slight. Von Economo has reported a case with a two year chronic course but in this, and in three others on record, the later symptoms seemed to be more sequelae of the disease.

Levison. NEUROENCEPHALITIS SIMULATING PARALYSIS AGITANS. [Ugeskrift for Laeger, February 24, 1921.]

Two cases with influenza were followed by symptoms simulating paralysis agitans. The first was that of a forty-four year old male, who was confined to bed for a short time by an attack of influenza. This attack was then followed by restlessness, paresthesia, and slight pain in the arms and legs. He felt tired and experienced great difficulty in walking, standing, and writing. Examined nearly eighteen months later,

he had paresis of both arms and legs, where the sensations of pain, touch, and temperature were reduced. The tendon reflexes were very weak, and there was considerable tenderness over the nerve trunks and muscles of the arms and legs. The clinical picture was that of polyneuritis. But the patient's expression, gait, and carriage were typical of a paralysis agitans. Another case in which the simulation of paralysis agitans was still more remarkable is recorded. The patient was a woman, aged thirty-three, who was confined to bed for about a month early in 1920 by a severe attack of influenza. Her gait was disordered, partly by pain in the legs, partly by tremor and rigidity. Her movements were slow and labored and her face wore the masklike expression of paralysis agitans. The tremor of the legs was greatest on the right side. In addition to anesthesia of both arms and legs there was a peroneus paralysis on the left side with reduction of the electrical irritability in the peroneus area.

Bonhoeffer. EPIDEMIC ENCEPHALITIS. [Deut. med. Woch., March 3, 1921.]

Since the middle of December, 1920, epidemic encephalitis has appeared in Berlin, and in the course of six weeks he has seen as many as 25 new cases. The course of the disease was very varied: a few cases terminated fatally soon after the onset of the disease; but recovery was the rule. In the absence of pneumonia and other complications the disease ran a favorable course contrary to the early Viennese statistics. The prognosis was bad when complicated by severe delirium, high fever and collapse. Provided the patient survived the disease by a few weeks, the prognosis was good; but in one case death occurred as late as the third week, paralysis of the muscles of deglutition being followed by brochopneumonia. Pneumonia was almost invariably found post mortem. The autopsy changes in the trachea and bronchi coincided closely with those of influenza, and as the two epidemics came and went at the same time, more than accidental relationship is suggestive. The action of arsenic and salicyl preparations was uncertain, but in one case lumbar puncture was rapidly followed by improvement in the patient's condition.

Zuccola. ENCEPHALITIS LETHARGICA. [Il Morgagni, February 28, 1921.]

A comprehensive clinical discussion founded on 25 cases with a mortality of 36 per cent. The period of incubation is difficult to determine. The three cardinal symptoms are (1) paralysis of the cranial nerves, especially affecting the ocular muscles; (2) lethargy; (3) fever. The ocular paralysis is more of the nature of a paresis than a true paralysis; nystagmus is fairly frequent. Of the cranial nerves the right facial is most often affected. Static strabismus is exceptional. Cases with marked phenomena of motor excitability are usually serious. The reflexes, vasomotor reflexes, sensibility, neuralgic pains, ear troubles, are discussed. Lethargy is not a constant symptom, but sleepiness is

very common. In natural sleep the eyes are turned upwards and outwards; this is not the case in the sleep of encephalitis lethargica. Whether this sleepiness is due to some affection of the hypophysis is fully discussed, and a decision left open; in some cases there seems a certain relation, but not in all. One ought to speak of a center for wakefulness rather than a center for sleep. The temperature usually increases and defervescence is by lysis. The pulse is generally independent of the temperature; bradycardia is a bad sign. Meningeal symptoms vary in intensity. The cerebrospinal fluid usually issues at low pressure. The Wassermann reaction is negative. Leucocytosis is generally present, but is not very marked. The kidneys are not affected. The macroscopic and microscopic appearance in the brain are described. Then follows a description of the various clinical forms (hyperkinetic, delirious, ambulatory, soporous). As to the relation between influenza and encephalitis lethargica the author is not prepared to give a definite opinion; there is much to be said on both sides. Various experiments with germs are described. Prognosis should be reserved. The differential diagnosis is discussed and certain therapeutic measures—for example, lumbar puncture, urotropin, and various serums—are referred to, but without any confidence as to the benefit derived therefrom. [B. M. J.]

Duverger and Barré. OCULAR SYMPTOMS IN EPIDEMIC ENCEPHALITIS. [Bull. Méd., April 1921, XXXV, No. 18.]

This clinical paper records the numerous ocular manifestations of this disease. The Parkinsonian form shows them almost invariably. Similar symptoms are found also in true paralysis agitans and in certain pathologic conditions in the labyrinth. These ocular sequelae of epidemic encephalitis will have to be borne in mind in examining the eyes for years to come. They should not be mistaken for the ocular manifestations of neurosyphilis.

Kidd, L. J. RESIDUAL STATES AFTER LETHARGIC ENCEPHALITIS: A REVIEW.

Many cases have lately been described, in many countries, of a condition closely resembling paralysis agitans coming on acutely after an attack of a more or less typical lethargic encephalitis. Some of the cases have occurred in children and young adults, so that a juvenile paralysis agitans has been simulated. In a good many cases this Parkinsonian syndrome has lasted for more than a year without notable change; in a few of these complete recovery has then gradually taken place. But at present we are uncertain whether any of these cases pass gradually into a permanent true paralysis agitans with a slowly progressive course and ultimately fatal result. Perhaps the following is the commonest mode of onset of these post-encephalitic Parkinsonian syndromes: after a period of fever, delirium, ocular palsies, and somnolence, there appear psychical symptoms such as general apathy, listlessness

and slowness, and speech disturbances, and sometimes bulbar symptoms and dysphagia. There may be catatonia, stereotyped or manneristic movements, grimaces, or catalepsy, so that an erroneous diagnosis of schizophrenia has been made. There is a fixed, expressionless, masklike facies, with or without some facial paresis; salivation is often extreme; the cornea is dry owing to the infrequency of blinking of the eyelids; choking attacks are fairly common, especially in drinking; swallowing of solids may be slow and difficult. The voice is monotonous; speech is slow, may be slurred and even quite unintelligible. Articulation is defective. Involuntary movements or tremors may involve the head, face, neck, trunk, or limbs. The attitude of the body is usually bent forward; gait is often slow and shuffling; sometimes we have short, quick steps. Retropulsion is often present. Slight double ptosis is common. There may be sluggish reactions of the pupils, both to light and on convergence, and to painful stimuli. The arms are usually held flexed in front of the trunk. With the choking attacks there may be fatigue in chewing food.

The mode of onset of the Parkinsonian syndrome varies a good deal: in one of Mingazzini's cases signs of paralysis agitans occurred at the onset of the encephalitis; in another they appeared without any preceding fever or somnolence. In one of Carp's cases stiffness and speech disturbances appeared a few weeks after diplopia and somnolence without fever. In another of his cases the first thing noticed was the presence of involuntary movements of legs, arms and hands; soon afterwards a dreamy state came on, which the patient could not remember well, lasting for three months with rise of temperature. When this improved, he had speech disturbances. Six months later somnolence returned; three months later he showed the attitude and gait of a paralysis agitans, with slow, indistinct speech and salivation. Psychically he was indifferent and self-contained (to some extent this was his natural state); he recognized his altered state, and felt he was inhibited in his movements. He showed a tendency to perseveration and reactive catalepsy in his arms. He appreciated jokes, and gave correct answers, and was quite accessible. Although in many respects he made one think of a schizophrenia, yet against this was the onset of his illness with fever, great somnolence, ptosis and tremors, and also the fact that he was accessible and had normal affective reactions.

These residual post-encephalitic Parkinsonian syndromes do not appear to differ from the genuine forms of ordinary paralysis agitans. Epidemic lethargic encephalitis attacks by preference the basal ganglia and the midbrain nuclei. In fatal cases Gross found almost invariably changes in the subthalamic region, substantia nigra, and the thalamus; in a smaller number of cases the striatum was affected. The foci were almost always seen exclusively in the grey matter. It is known that in many cases of ordinary paralysis agitans lesions are found in the basal ganglia, so that the signs of that disease can be partly explained by

the existence of lesions of cell-groups and paths which unite the striatum with the thalamus, red nucleus, and the cerebral cortex and cerebellum. By the two Vogts these disturbances are attributed to a damage of the strial-neurone system, and they regard the tremor and rigidity of paralysis agitans as especially a dysfunction of the globus pallidus of the striatum. Ramsay Hunt looks on the rigidity as the sequel of atrophy of the cells of the striatum. Jelgersma found in paralysis agitans an atrophy of the radiations of the lenticular nucleus to the midbrain and subthalamie region. In one case Mingazzini found a cyst which had destroyed the caudate nucleus and a part of the internal capsule and lenticular nucleus; he regards acutely occurring paralysis agitans as due to damage of the striatal region. It is thus comprehensible that encephalitic foci which occur in the basal ganglia can give rise to signs that resemble those of paralysis agitans and need not differ fundamentally from them. As to the prognosis of these post-encephalitic residual Van Londen points out that it need not be unfavorable; he saw in one case gradual recovery after a high degree of paralysis agitans without tremor had been reached. And another patient, who showed great muscular rigidity and catatonic signs, recovered completely. The best therapeutic result has been gained by arsenical preparations. Tinel specially mentions intravenous injections of enesol. Netter found no benefit from the formation of a fixation-abscess.

Davis and Kraus. COLLOIDAL GOLD CURVE IN EPIDEMIC ENCEPHALITIS. [Am. Journ. of Med. Sc., January 1921, CLXI, No. 1.]

These authors have not been able to find any definite parallelism between the colloidal gold curves and the severity and duration of epidemic encephalitis. In a large percentage (41 per cent) of cases of epidemic encephalitis chemical changes are present in the nervous system. These give rise to substances able to bring about an abnormal colloidal gold reaction in the C. S. F.

Comby. ACUTE ENCEPHALITIS IN CHILDREN. [Bull. Soc. de Péd. de Paris, February 15, 1921.]

This author, in the course of fifteen years, observed 62 cases of acute encephalitis, whether sporadic or epidemic, primary or secondary, in children aged from one and one-half months and upwards. Apart from epidemic encephalitis, the causes of the condition were as follows: Influenza, 12 cases; enteritis, 10 cases; pertussis, 7 cases; congenital syphilis, 2 cases; measles, 2 cases; vaccination, 2 cases; gastric disturbance, 2 cases; fall on the head, 2 cases; otitis, 1 case; carbon dioxide poisoning, 1 case; unknown causes, 21 cases; 27 cases were in boys and 35 in girls. In 32 the onset was sudden. When the encephalitis was secondary to an acute infectious disease the onset was often insidious and might escape notice altogether. Spasms, contractures, and rigidity were noted in a larger number of cases. The eyes were frequently

involved, as was shown by ptosis, strabismus, mydriasis, diplopia, nystagmus, and conjugate deviation. Optic neuritis, causing blindness, was observed in 2 cases. Aphasia and mutism were occasionally noted. Transient or persistent paralysis was more frequent, spasmodic hemiplegia being observed in 18 cases—in 10 on the right and in 8 on the left side—brachial monoplegia in 1 case, paraplegia in 5 cases, facial paralysis in 7 cases, and vesical paralysis in 1 case. Myoclonic symptoms were frequent, especially in the epidemic encephalitis of the last three years. Lethargy was less common than insomnia. Fever was very variable. There was often apyrexia or moderate fever. In a few cases the temperature was as high as 105.8° F. The acute stage might be followed by psychical or motor disturbances, such as dementia precox, backwardness, loss of memory, epilepsy, spastic paralysis, and athetosis. The prognosis of acute encephalitis appeared to be less severe in children than in adults. Six of the 62 cases died—a mortality of 9.60 per cent. Recovery without sequelae occurred in 20 per cent, and recovery with sequelae in 66 per cent. Treatment was only symptomatic or palliative, and consisted in application of an ice-bag to the head, blisters to the back of the neck, and purgative enemata. Comby condemns fixation abscess, which is warmly recommended by Netter, as barbarous and ineffective. [B. M. J.]

De Lisi, L. PARKINSONISM. [Policlinico, November 1, 1921, XXVIII, Med. Sect., No. 11. J. A. M. A.]

De Lisi tabulates the details of ten cases of Parkinsonism following epidemic encephalitis in recent years. The ages ranged from thirteen to thirty-nine, and the Parkinsonism had developed after a period of apparent convalescence. As autumn approached the Parkinsonism became installed and has been slowly progressive or stationary since. Only one of the patients has shown any tendency to improvement of the condition. This is a young woman and there is now only a persisting diffuse rigidity. There is general tremor only in one of the ten cases but tremor of the tongue and catalepsy are common. The disturbances are strictly motor, not sensory, but sialorrhea is profuse.

Pierre-Kahn and Benda. EPIDEMIC ENCEPHALITIS AND A DEMENTIA PRECOX SYNDROME. [Presse Médicale, November 26, 1921, 944.]

A woman of thirty-seven showed the classical aspect of hebephrenocatatonia: intermittent stereotypism of attitudes, with perseveration, negativism, opposition, and mutism. She had been ill for eighteen months, and before she arrived at this state she had passed through two successive attacks, separated by remissions, the first of which was a confusional state, and the second a lethargic syndrome characterized by somnolence and myoclonic shocks of the thorax. The case is regarded as a phase of encephalitis interrelated between two periods connectable clinically with catatonia. The question is raised whether the encephalitis

and the dementia precox are not the clinical phases (differing by the anatomical lesions present) of a single group of acute or subacute affections of the brain, showing in turn the lethargic, myoclonic, choreic, Parkinsonian, and hebephreno-catatonic (dementia precox) forms of encephalitis. [Leonard J. Kidd, London, England.]

Clerc, Foix, and Mercier des Rochettes. EPIDEMIC HICCOUGH WITH AUTOPSY. [Bull. et Mém. Soc. Méd. des Hôp. de Paris, April 21, 1921.]

A fatal case of epidemic hiccough in a woman, aged sixty-eight, came to these observers' attention. The hiccough had persisted for six days, when the next day the temperature rose to 100.4° F. and the patient died the following day with a temperature of 104° F. Histological changes of epidemic encephalitis were found. The situation of the lesions were confined to the cervical portion of the spinal cord, in which the cervical synapses of the phrenic nerve were chiefly located.

Barré and Reys. POSTENCEPHALITIC PARKINSONIAN SYNDROME. [Bull. Méd., April 1921, XXXV, No. 18.]

Atropine as the most effectual treatment in the 20 per cent of cases showing the Parkinsonian syndrome is here suggested. This is on a basis of about 100 cases. Scopolamine and atropine for five days in turn, or with shorter alternations, combining the scopolamine with morphine, and suspending for a few days after ten injections of each drug is their routine treatment. Relief which may be transient is frequent. The tremor is more rebellious than the stiffness. The effect of atropine, 1 or 2 cg. daily, fractioned, was more durable in the three cases thus treated. In the milder cases the scopolamine was given by the mouth—one-quarter mg. once or twice a day—for several weeks with improvement.

Colver, B. N. BOTULISM. [Mich. State Medical Society Journal, October 1921, XX, No. 10. J. A. M. A.]

Botulism, says Colver, is essentially a toxic encephalitis affecting the nuclei of the pons and medulla and with rapid course. Epidemic encephalitis is an infectious process affecting, as a rule, the cortex, the meninges or the basal ganglia of the upper cranial nerves and with more deliberate course.

Rüttimeyer. POSTENCEPHALITIC INSOMNIA. [Schweiz. med. Woch., January 6, 1921, LI, No. 1.]

Eight cases in children of five to eight years of age are here reported with the following syndrome: After an acute febrile disease, influenza or epidemic encephalitis, they were unable to sleep until 4 or 5 A.M. This insomnia persisted for three or six months. In two other cases this symptom was a feature of epidemic encephalitis. He quotes Pfaundler as having reported a similar series of cases of postencephalitic insomnia in Munich. No benefit was derived from sedatives. The

insomnia yielded to psychotherapy in all except those with persisting organic signs of brain lesions.

de Tommasi, P. MULTIPLE SCLEROSIS AFTER ENCEPHALITIS. [*Riforma Medica*, July 1921, XXXVII, No. 29.]

In this clinical record a girl of eight developed encephalomyelitis after influenza. A typical multiple sclerosis syndrome developed.

Levaditi, Harvier and Nicolau. HEALTHY CARRIERS OF THE VIRUS OF ENCEPHALITIS LETHARGICA. [*C. R. Soc. d. Biol.*, June 25, 1921.]

These observers have called attention to the existence in the saliva of a normal person of a virus capable of giving rise to acute encephalitis in the rabbit. This paper is a record of further investigations which they have carried out. The saliva of a perfectly healthy individual, who had frequently been in contact with cases of encephalitis, but who had never presented the least sign of the disease, was injected by corneal scarification into a rabbit. On the second day after inoculation an intense kerato-conjunctivitis developed, which gradually became worse till the ninth day, when the animal was so ill that it was killed, having meanwhile deviation of the head to the affected side, strabismus, and spasmodic respiration. Typical lesions were found in the brain, consisting of mononuclear meningitis, perivascular cuffs of cellular infiltration, and scattered foci of acute encephalitis. From the cornea of this rabbit a series of twelve corneal passages were made on fresh rabbits, and from the brain a series of eleven cerebral passages; in every case death occurred from encephalitis. To show that the virus giving rise to the corneal lesions and the virus giving rise to the cerebral lesions were alike cross-inoculations were made, the corneal virus being injected into the brain, the cerebral virus inoculated on to the scarified cornea. Encephalitis ensued in each case. The filtrability of the virus was demonstrated, and a cross-immunity reaction with a fixed virus taken from a case of human encephalitis was made successfully. This evidence is sufficiently conclusive to show that the virus of encephalitis may exist in the saliva of healthy contacts, and may—at least in the case of rabbits—give rise to the disease by artificial transmission.

Levaditi, Harvier and Nicolau. ETIOLOGICAL CONCEPTION OF LETHARGIC ENCEPHALITIS. [*C. R. Soc. Biologie*, July 2, 1921.]

In this hypothetical discussion the authors state they have found four types of virus. (1) The salivary virus of healthy subjects, inoculated on to a rabbit's cornea either produces no effect at all or it gives rise to a kerato-conjunctivitis of variable intensity; it cannot be carried indefinitely from cornea to cornea, and it never gives rise to a fatal encephalitis. (2) The salivary virus of healthy carriers; this is distinguished from the preceding virus in that it is transmissible indefinitely

from cornea to cornea, and that it gives rise not only to a keratitis, but to a fatal encephalitis. (3) The virus of herpes; this has been isolated from corneal and from labial herpes, and, except for its lesser virulence, cannot be distinguished from the virus of encephalitis. (4) The virus of lethargic encephalitis; this is obtainable from the hairs of patients who have succumbed to encephalitis, or from their nasopharyngeal secretions during life. Taking each of these in turn, and working out their cross-immunity reactions, they have reached the conclusion that these four types of virus are of the same nature, though of unequal virulence; they are related to each other in much the same way as are the more or less pathogenic type of streptococcus, meningococcus, or pneumococcus. It must be admitted, therefore, that previous to the epidemics of encephalitis the virus of the disease already existed in the saliva in such manifestations as herpes and the herpetic anginas. Owing to a progressive increase in the virulence of the organism it has acquired the new faculty of being able to attack cells of the nervous system, with the consequent appearance of lethargic encephalitis.

Cruchet. THE PROGNOSIS AND SEQUELÆ OF LETHARGIC ENCEPHALITIS. [Bull. et Mém. Soc. Méd. des Hôp. de Paris, March 17, 1921.]

Between March, 1918, and February, 1921, this neurologist has observed 32 cases. Thirteen of these showed bulbo-pontine localizations; 8 were of the meningoencephalitic type; 7 mental; 2 convulsive, and 1 hemiplegic and spinal forms. Twelve cases, or 37.5 per cent, were fatal, and of the remaining 20 the great majority developed symptoms resembling paralysis agitans, myoclonic movements, or mental symptoms. Cruchet concludes that though as regards life recovery is relatively frequent, the occurrence of grave sequelæ is universal.

Lemoine. LETHARGIC ENCEPHALITIS AND EPIDEMIC HICCUGH. [Bull. et Mém. Soc. Méd. des Hôp. de Paris, March 17, 1921.]

Economo recorded hiccough in Austria which was followed in about a month's time by the appearance of myoclonic encephalitis. Similar cases were seen by other observers in the Tyrol and Italy. Lemoine here reports the case of a man suffering from epidemic hiccough, whose brother, with whom he had been in close contact four days after the onset, developed lethargic encephalitis five days later.

Wells, M. BOTULISM AND THERAPY. [Mich. State Medical Society Journal, October 1921, XX, No. 10.]

In Wells' case canned spinach was the source of the poison. In the treatment rest in bed and liquid diet were used from the onset, together with strychnin in doses of 1/60 grain hypodermically every four hours as indicated by the apparent bulbar paresis. Difficulty in swallowing made it necessary to introduce medication and various forms of liquid nourishment into the stomach per Ewald tube for four days. Castor oil

and enemas were apparently of little avail in securing bowel activity, but pituitary extract hypodermically accomplished satisfactory results on each occasion. Graham's antitoxic serum was, however, the agent to which credit is given by Wells for effecting a cure in this case. The usual desensitizing dose of 3 or 4 minims was given, and then regular dosage of from 5 to 15 c.c. intravenously at intervals of from six to twenty-four hours during the subsequent four days. In all this patient had 115 c.c. of botulinus antitoxic serum over a period of four and one-half days, 45 c.c. of which were polyvalent and 70 c.c. type A serum; 97 c.c. were given intravenously and 18 c.c. subcutaneously. Definite improvement in swallowing, in speech, and in general appearance, followed the administration of serum from the third day and at times temporary relief of the sense of constriction in the throat and of occasional difficulty in breathing was mentioned by the patient about an hour after the serum injection. [J. A. M. A.]

Harvier. EXPERIMENTAL EPIDEMIC ENCEPHALITIS. [Rev. d. Méd., June 1920, XXXVII, No. 6.]

This laboratory worker has succeeded in transmitting a disease which he (incorrectly?) assumes to be epidemic encephalitis to rabbits. The virus becomes "fixed" by passages through these animals, killing them between the fourth and sixth day. The nervous disturbances and the histologic lesions of the nerve centers are identical, he says, with those observed in man. [This is impossible since neither the nerve elements nor the behavior of rabbit and man are identical.] It is filtrable but is not pathogenic for the monkey and the guinea-pig when derived directly from man, but it becomes pathogenic after several passages through rabbits. He states it is impossible to induce crossed immunity between poliomyelitis and encephalitis. [Comparison of lower animal pathology and human pathology are filled with errors. The pharmacologist has learned somewhat of this in drug action comparisons. The laboratory worker must do so. Ed.]

Walshe, F. M. R. THE SYMPTOM-COMPLEXES OF LETHARGIC ENCEPHALITIS. [Brain, Vol. XLIII, Part 3.]

In this comprehensive and scholarly résumé the author takes up most of the kaleidoscopic aspects of this syndrome. The numerous schemes of classification and description, though inevitable in the early and growing stages of knowledge of so polymorphic a disease, are in fact tending to confuse rather than to lend precision to our conceptions, since almost every case presents either simultaneously or at some phase the features of several "clinical" types. The example of "myoclonic encephalitis" is discussed to demonstrate the misleading results of a purely symptomatic basis of classification and description. Description upon an anatomical basis, he thinks, would obviate confusion and at least ensure a uniform terminology. For example, lethargy may exist

with signs of a lesion of the cortex, basal ganglia, midbrain, cerebellum, lower motor neurones or spinal nerve roots. It seems probable that the "choreiform" manifestations, the Jacksonian fits and the muscular contractions collectively grouped by various writers as "myoclonic," are the expressions of an irritative or exciting action of the virus of the disease upon neurones of the three physiological levels (Jackson) and that such symptoms may be localized according to the same principles which hold in the case of negative or paralytic symptoms. From these considerations this striking feature emerges that negative or paralytic symptoms indicate a selective action on the cells of the basal ganglia and certain cranial nerves. On the other hand, in its irritative or exciting effect, the virus acts equally on any and every part of the nervous system, from cerebral hemispheres to spinal roots; hence the polymorphic character of cases characterized by what may be called irritative symptoms. Possibly the virus is a complex one, containing more than one active component.

De Massary and Boulin. CHRONIC LETHARGIC ENCEPHALITIS. [Bull. d. l. Soc. Méd. des Hôp., December 10, 1920, XLIV, No. 38.]

This clinical report of a progressive encephalitis occurring in a young woman which was fatal the ninth month. Also in a woman of fifty-seven with intense neurasthenia which marked a lethargy. Typical lethargic encephalitis did not become manifest until ten months later. It is almost impossible to distinguish between an ordinary case of epidemic encephalitis, entailing sequelæ, and these chronic progressive types; but the outlook with the latter is graver as they are more liable to progress to a fatal termination.

Jaksch, R. EPIDEMIC COMA. [Zentralbl. f. inn. Med., March 20, 1920.]

A clinical report of cases seen in Prague during 1919-1920. Fever and delirium, which recovered without any further nervous disturbances apart from transient ocular palsies and a certain degree of somnolence were frequent symptoms observed. The course of the disease was quite different in other cases. After an initial stage of cortical irritation coma set in and lasted from eight to fourteen days, during which the respiration was unusually deep and labored and all signs of meningeal irritation were absent. Bacteriological examination of the blood, cerebrospinal fluid, urine, etc., was negative. Jaksch is of the opinion that the condition is due to an influenzal toxin. Such cases repeatedly occur after epidemics of influenza as has been repeatedly shown.

Rhein, J. H. W. ENCEPHALITIS LETHARGICA. [N. Y. Med. Jour., May 1920, LXI, No. 18.]

In this clinical résumé a summary of our present knowledge of this disease is given with a report on three new cases. In all of these the

lethargy was pronounced, though in two cases there was at times a mild delirious state, preceded in both instances by a lethargic state which lasted until death. Other points of interest in these cases were that they occurred during the epidemic of influenza and that with the lethargy

Gaines. EPIDEMIC ENCEPHALITIS. [Ga. Med. Assn. Journ., December 1920, X, No. 7.]

A clinical and historical study of six cases. Epidemic encephalitis has been prevalent since 1918 in Georgia. When headache, ocular palsies and diplopia, with slight fever and insomnia followed by lethargy appear, one should suspect an epidemic encephalitis.

there was associated a disturbance of the extraocular movements and what appeared to be a double ptosis; the responses which these patients gave to questions when aroused seemed to be perfectly lucid; the temperature changes were insignificant until shortly before death. The disease was usually ushered in by the appearance of catarrhal manifestations of the mucous membrane of the eyes, throat, and bronchial tubes. As a rule the symptoms developed gradually, though the onset might be sudden, as by the occurrence of a convulsion or fainting spell. Headache is common and diplopia a common symptom. Slight fever is almost always present. Somnolence, lethargy, stupor, and coma appear in about 80 per cent of the cases. Paralysis affects the oculomotor nerve mainly and next in frequency the facial nerve. In some cases there are no localizing symptoms. A review of experimental work shows that further studies are necessary to determine the nature of the virus and its relation to influenza. The treatment is entirely symptomatic, though withdrawal of the spinal fluid may give relief if there is increased pressure.

Marie, P., and Levy, Gabrielle. THE EXCITOMOTOR SYNDROME OF EPIDEMIC ENCEPHALITIS. [Revue Neurologique, June 1920.]

In this clinical discussion these observers call attention chiefly to the motor syndromy of certain groups of these cases. They are chiefly: (1) Choreic movements. In one case there were rhythmic, choreic movements distributed generally, but not on the face, which came on three months after the initial febrile attack and were unattended by any objective sign of nervous lesion. In another case the movements are described as having been of the rhythmic, saluting form. (2) Bradykinetic movements. These are represented by slow, regular, rhythmic movements of great amplitude, affecting one extremity alone or sometimes the two extremities on one side. (3) Myoclonus. The authors merely mention this because it has been fully described by Sicard. (4) The Parkinsonian syndrome. Of this two forms, acute and progressive, are discussed. In the acute form there is tremor (it may be of the whole body) and difficulty in walking, speaking and writing, as well as mental disturbances of a melancholic character. In the progressive form

muscular rigidity is the dominant sign and tremor supervenes only with the execution of movements. (5) Tremor. This is simple in kind, rapid and fugacious, thus differing from the movements of Parkinson's disease and chorea. (6) Localized facial movements. These movements have been described by other writers. Here attention is drawn to one having a faciobulbo-masticatory localization. Finally, in regard to all these movements it must be mentioned that they arise at various stages of the disease, either in the opening illness or a week and even months later. The period of their duration also varies enormously. And in regard to diagnosis, in addition to the classical signs of lethargy, slight fever and oculomotor trouble, which are not necessarily present, a number of other signs may be encountered, *viz.*, painful stiffness of the neck, trouble in chewing, facial spasm, increased salivation, lingual tremor, dysphagia, hiccup, a sense of suffocation and various muscle and tendon pains.

Tagle, Ernesto Prado. EPIDEMIC ENCEPHALITIS. [Soc. Med. de Chile-Santiago, August 20, 1920.]

C. M., fourteen years old, student, entered the Medical Clinical Service of Prof. Garcia Guerrero, in the middle of August 1920. Hereditary and personal antecedents of no importance. He is well developed, physically and intellectually. Nothing abnormal in his studies and works; but two months ago he began to complain of a severe pain in the eye balls. Ten days ago, those who surrounded him, noted a special retreat (seclusion); he walked silently and persistently; he was afraid of nothing; he looked sad, afflictively; after, he complained of general uneasiness and double vision. He was obliged to go to bed; the somnolence firstly was little marked, but profound later.

When examined, he had subfebrile pulse, 85, regular; catatonic manifestations of the superior members, divergent strabismus of the right eye and incontinence of urine. He does not answer to the questions addressed to him, but he obeys—although with difficulty—the special orders to open and close the eyes, to stand; when ordering him to walk, he cannot go ahead, and presents tremulous movements in the superior and inferior members similar to Parkinsonian ones. There is a little rigidity of the nape of the neck, and resistance to the passive lateral and rotation movements of the head. Contraction of the elevator muscles of the lip and of the sides of the nose. Kernig debility positive; rotation reflexes, catatonic.

Lumbar puncture occasions the outlet of a clear liquid (14.5 c.c. 3) on pressure, the analysis of which reveals:

Albumin.....	0.15 grams	0/00
Chlorides.....	8. grams	0/00
Glucose.....	0.70 grams	0/00

23 leucocytes per mm. 3 (Nageotte Cell) with lymphocytosis of 98 per cent. Pandey's and Wassermann's reactions were negative. The bacteriological research negative.

Clinic course. Temperature maintaining between 38.5 C and 38.8 C; the pulse was increasing in its frequency; his general state became worse; the coma came, and death a few days after his entry in the hospital. The autopsy shows a congestion and edema of the cerebrum, a little hydrocephalus internus, hortensia colored in little focus (spaces) of some cerebral circumvolutions. There is no macroscopical alterations neither from the bulb nor of the medulla and peduncles. The other organs (kidneys, liver, etc.) present only congestives and degeneratives, lesions not very intense. The microscopical exploration shows vascular lesions, and of the nervous cells also: (a) *Vascular lesions*. Cellular infiltrations, perivascular, specially localized in the vases of the former region of the protuberance; (b) *Lesions of the nervous cells*. Disappearing of the pigment of the *locus niger* cells in both sides, chromolysis, and absence of Nissl's granulations, specially in the protuberance, peduncles, optical bed, and cerebral crust (better marked in the two first regions). The granulations of Nissl in the cells of the medulla of the cervical region and in the bulb appears very clearly.

The experimental study (injection of $\frac{1}{2}$ c.c. 3 of glycerinated emulsion of cerebral crust in three rabbits). Two of them died before 48 hours; the third presents in the fourth day a trembling during repose, paresis of the anterior extremities, exaltation in the reflexes, clonus; the next day incoördination of the movements, loss of the equilibrium; temperature 39° C in the sixth day; the death: the autopsy shows only congestion and edema of the cerebrum.

Commentary. This case presents not only the clinical character of the epidemical encephalitis, but the histo-pathological and experimental ones, noted by other investigators, and I believe that this is the first in which a more or less complete study and observation could have been made. It is very important to be noted once more: (1) The increasing of the liquid in the cerebrospinal conduct; (2) the normality of the contained albumin in the same liquid; (3) the augmentation of the glucose; and (4) the increasing of the number of cellular elements per mm. [Author's abstract.]

Massari, C. EPIDEMIC ENCEPHALITIS SIMULATING ACUTE ABDOMINAL DISEASE. [Wien. klin. Woch., March 4, 1920.]

This paradoxical phenomenon has been noted in influenzal encephalitis and also in this new epidemic of encephalitis. The author reports six cases in which the clinical picture was at first dominated by abdominal symptoms. Several of these cases were sent to hospital as abdominal emergencies requiring immediate operation, and in one case laparotomy was performed in order to relieve acute intestinal obstruction. Parts of the small and large intestine were found in a state of maximum contraction, and the circumference of the contracted small

intestine was reduced to that of the little finger. The contracted sections of the intestine were very pale; the sigmoid flexure was almost white. The patient died five days after the operation, and the necropsy showed pneumonia and numerous punctiform hemorrhages into the brain. Discussing the differential diagnosis in such cases, the author draws attention to the curious flushed condition of the patient's face, the bradycardia, the comparatively low temperature, and the short interval between abdominal palpation and the response of pain. In true peritonitis palpation provokes instant pain. The author refers to a recent paper by Dimitz, who has noticed that an early sign of epidemic encephalitis may be twitching of the diaphragmatic and abdominal muscles, accompanied by severe abdominal pain.

Fracassi, Teodoro. EPIDEMIC ENCEPHALITIS IN ROSARIO. [Médica del Rosario, Argentina, July 1921, XI, No. 3.]

This author had observed some cases as far back as 1911-1913, which he had diagnosed differently. At the time, the diagnosis was syphilitic meningitis, notwithstanding the absence of a history and signs of syphilis and the lack of benefit from specific treatment in one of the cases. The other showed some improvement under it. In 1919, fourteen cases came to his attention.

Spät, W. SEQUELS OF EPIDEMIC ENCEPHALITIS. [Wien. klin. Woch., August 11, 1921, XXXIV, No. 32.]

This author has conducted an inquiry into the after history of 19 cases of 22 that recovered from the acute stages of an epidemic encephalitis. He accounts for the low mortality as being due to the mildness of the infection in part and the use of hypnosis on appearance of motor excitement. In addition to this regular systematic lumbar puncture during the lethargic stage. The patients were workmen in a steel works, and in many of the mild cases the later developments have been disappointing. In 4 patients, especially, the relapses presented severe complications; one who, the first time, was admitted to the hospital in a raving condition but was quieted by hypnosis and dismissed in fourteen days completely cured, was readmitted a few weeks later in the same raving condition. Under hypnotic influence he soon became quiet and slept quietly the night through. He was found to be suffering from a unilateral paralysis, which gradually receded, partly spontaneously, and partly as the result of electric treatment. In the other 3 cases the sequels did not develop for several months. A boy who after a two-weeks lethargic stage with high fever, convalesced rapidly, returned to the hospital, several months later, with paralysis of the facial nerve, which after several months' treatment gradually receded but did not disappear entirely. His drowsiness has finally disappeared. When first taken ill, 2 patients presented choreic jerks and a moderate fever. The motor excitement was promptly relieved by hypnosis. Several months

later these 2 patients presented the facial expression, body attitude and gait of paralysis agitans, but without the tremor. Headache and weakness in the legs are also complained of. A number of other patients are unable to work on account of persistent headache and sleeplessness. Spät regards these postencephalitic manifestations as partly the result of organic changes in the brain, and partly as of a functional, psychic nature. In many cases all therapeutic measures have proved unavailing.

Pearl, R. STATISTICAL NOTE ON EPIDEMIC ENCEPHALITIS. [Johns Hopkins Hospital Bulletin, July 1921, XXXII, No. 365. J. A. M. A.]

Pearl shows that in 1920 the case incidence of epidemic encephalitis increased in New York City nearly five-fold over 1919. At the same time the case fatality rate increased from 26 per cent of the attacked to 37 per cent of the attacked. It is believed that this increase in case fatality rate is a real phenomenon, and it is certainly statistically significant. The seasonal incidence, as judged by monthly distribution of cases was significantly different in 1920 from what it was in 1919. The peak of mortality in an epidemic outbreak may be expected to occur from 23 to 37 days after the peak of case incidence (morbidity). There is a significantly larger proportion of males among the attacked than there is in the general population, or, put in another way, males are especially susceptible, to a statistically significant degree. Deaths occur among males no more frequently in comparison with females than would be expected from the normal proportions of the two sexes in the population at large. The disease is not more likely to attack either males or females at one age than at another. The age distribution of attacked cases, in other words, does not significantly differ in either sex from the age distribution of the general population. The age distribution of deaths does differ significantly in both sexes from the age distribution of the population. There appears to be a definite tendency for the disease to be more fatal in the higher age groups.

Arias, B. R. SPINAL FLUID IN EPIDEMIC ENCEPHALITIS. [Revista Española de Medicina y Cirugía, July 1921, IV, No. 37.]

This laboratory contribution gives the details of twelve cases in which there was a high sugar content and slight albumin content, with intense but transient hypercytosis. The colloidal gold test may show positive.

Claude, H. MENINGEAL SYMPTOMS AND LETHARGIC ENCEPHALITIS. [Bull. et Mém. Soc. Méd. des Hôp. de Paris, January 29, 1920.]

Meningeal irritative signs and narcolepsy are here reported in three cases. They were significant because of their rapid and mild course, and because they formed intermediate types between meningitis and lethargic encephalitis. Two developed meningeal symptoms, Kernig's sign, and

spinal rigidity, diminution of the reflexes, retention of urine, lymphocytes in the cerebrospinal fluid, and excess of albumin. Recovery took place apart from slight apathy, somnolence, and nuchal rigidity. Headache, inequality of the pupils, and external strabismus followed by somnolence was the syndrome in a third patient. The cerebrospinal fluid showed increase in cells and albumin. Subsequently slight spinal and nuchal rigidity developed. A tendency to somnolence persisted in spite of gradual improvement.

Pierfrancesco. TREATMENT OF LETHARGIC ENCEPHALITIS. [Rif. Med., February 7, 1920. B. M. J.]

This author reports 10 cases seen by him. The ages varied from fifteen to sixty-four. The incubation period varied from a few hours to five or six days, and in the majority of the cases presented influenza-like symptoms. In 2 cases the first symptom was diplopia, and in 2 others general choreiform movements. Somnolence usually appeared in the first week and lasted from a few days to several weeks—in 3 cases it failed altogether. Diplopia was present in 6 cases. The left elevator palpebralis was paretic in 5 cases, the right in 2. More or less marked paresis of the left facial nerve was noted in 6 cases. In one rapidly fatal case there was paralysis of the twelfth nerve. Where paralysis of the extrinsic muscle of the eye was present there was nearly always some affection of the external recti. True symptoms of meningeal irritation were never seen. Myoclonus and static tremor of the upper limbs was noted in 5 cases and 4 showed dynamic ataxia. The reflexes were abolished in 4 cases, normal in 3, rather active in 3. The pupils in five cases were small, in 3 dilated, and in 3 normal. No changes were seen in the fundus. Dermographism was marked in 4 cases, slight in 3. Lumbar puncture gave a clear fluid six times, the fluid was hemorrhagic twice, and in 2 cases the liquid had a dichroic appearance. In 6 cases it issued under weak pressure and in 4 cases under high pressure. The pulse and temperature were not specially characteristic. Death occurred in 6 of the cases—in 3 due to bronchopneumonia, in 2 from coma, and in 1 quite suddenly. Lumbar puncture, injections of colloidal silver, anti-streptococcic serum, or phenol all gave equivocal results, but some advantage seemed to be gained from repeated hypodermic injection of iodine in small doses. Attempts to find the causative agent were not very successful, but in 1 case an organism was isolated—a Gram-resistant diplococcus with rounded ends and a tendency to group in small chains of six or eight. J. Sabrazès and C. Massias (*Gaz. hebd. des Sci. Méd. de Bordeaux*, February 22, 1920) have successfully treated two cases of lethargic encephalitis by intraspinal injection of serum from patients convalescent from the disease. The first case, a youth, aged seventeen, was given 35 c.c. of serum which had been taken from his father. The second patient, aged twenty-three, when *in extremis* received an intragluteal injection of 20 c.c. of blood taken from the first

case and two intraspinal injections of 40 c.c. of serum from the same source. Rapid recovery took place in both cases.

Hofstadt, F. SEQUELÆ OF EPIDEMIC ENCEPHALITIS IN CHILDREN. [Zeit. für Kinder., July 12, 1921, XXIX, No. 5-6.]

Derangement of the sleep rhythm is here picked out as being so definite as to justify the present or retrospective diagnosis of epidemic encephalitis. The amyostatic syndrome of Strümpell, chronic choreiform or athetotic movement and psychic disturbances are common. An adiposogenital syndrome resembling dystrophia adiposogenitalis, in some cases combined with hypergenitalism, has been seen by him.

Sicard and Kudelski. LETHARGIC ENCEPHALITIS WITH RELAPSE. [Bull. et Mém. Soc. Méd. des Hôp. de Paris, January 29, 1920.]

A woman, aged twenty, presented the typical syndrome. This disappeared after two weeks and she was apparently well. Ten days later the somnolence and diplopia reappeared, accompanied by Millard-Gubler paralysis. The symptoms changed from one side to the other, the crossed paralysis being first localized in the right mesencephalon and then in the left. Complete recovery took place in about three months. The cerebrospinal fluid was negative.

Froment and Paliard. POSTENCEPHALITIC PARKINSONISM WITH YAWNING-LIKE MOUTH MOVEMENTS. [Presse Médicale, November 2, 1921, p. 876.]

The writers report a case of postencephalitic Parkinsonism associated with curious opening movements of the mouth like yawning, of variable degree and accompanied sometimes by closure of the eyelids. These mouth movements are not due to hypotonia of the elevator muscles of the mandible, for these muscles have full power; nor do they seem to depend on hypertonia of the depressors, as the mouth often remains closed during sleep. They are sometimes accompanied by true yawning movements. These peculiar mouth movements are attributed to a lesion of the central grey nuclei, the exact localization of which is at present unknown. [Leonard J. Kidd, London, England.]

Barach, A. L., and Woodwell, M. U. OXYGEN THERAPY IN LETHARGIC ENCEPHALITIS. [Archives of Internal Medicine, October 1921, XXVIII, No. 4. J. A. M. A.]

In two patients with lethargic encephalitis observed by Barach and Woodwell the development of an extreme type of shallow breathing was attended with deep cyanosis and coma. The arterial blood was markedly deficient in oxygen and contained an excess of carbon dioxid. Inhalation of oxygen greatly relieved the arterial anoxemia but was without effect on the steady accumulation of carbon dioxid. The circulation was strikingly improved in the beginning as a result of the relief of the

anoxemia. Later, progressive cardiac failure occurred, apparently related to the carbon dioxid retention. It is evident that shallow respiration, if extreme, interferes not only with oxygen absorption but with carbon dioxid elimination. The probability that a terminal involvement of the respiratory center in lethargic encephalitis is at times the cause of death is suggested.

Tarozzi, G. ANATOMICAL LESIONS IN THE SO-CALLED LETHARGIC ENCEPHALITIS. [Riforma med., 1920, XXXVI, 320.]

Tarozzi, G. ON THE ETIOLOGY OF LETHARGIC ENCEPHALITIS. [Riforma med., 1921, XXXVII, 226. Med. Sc.]

In his first communication the author pointed out that in the central nervous system of all cases of lethargic encephalitis investigated the characteristic changes of the malady had been found, as well as bronchopneumonic lesions similar to, if not identical with, those commonly seen in cases of influenza. He had, therefore, come to the conclusion that lethargic encephalitis was either a disease closely related to influenza or perhaps only a form of the latter. In his second note on the subject the author showed how, by means of subdural inoculations into rabbits of the filtered and sterile fluid of cultures of diplostreptococci isolated from the pulmonary foci referred to above, he had been able to obtain changes of the central nervous system identical with those seen in cases of lethargic encephalitis. Such changes chiefly consisted of meningeal, perivascular, and interstitial infiltrations exclusively formed of "lymphocytoid cells." Leucocytes and, apparently, plasma cells were not observed. The rabbits in which these infiltrative changes were found had been killed seven days after the inoculation, and the author is of the opinion that they might have survived much longer and perhaps completely recovered. Some rabbits inoculated subdurally with a very small dose of pure and not filtered cultures from the same diplostreptococci, died 24 hours afterwards, their central nervous system showing acute infective changes of an edematous and hemorrhagic character. The subdural inoculation of the same cultures warmed for two hours at 60° C. was not attended by satisfactory results. [C. d. Fano.]

Kling, Davide and Liljenquist. EXPERIMENTAL LETHARGIC ENCEPHALITIS IN RABBITS. [Hygiea, September 16, 1921.]

These authors have made rabbits sick by eating the C. S. F. of an encephalitis patient. A curious feature of their investigations was the absence of symptoms shown by the rabbits which were given intracerebral injections of the cerebrospinal fluid. They remained apparently quite well, and when they were killed, thirty-eight days after the inoculation, two of them showed no macroscopic or microscopic disease of the brain; but two others showed perivascular infiltration of the brain and meninges with mononuclear cells, the changes being exactly like those found in the central nervous system of human beings dying of lethargic

encephalitis. Passage of the virus from these two rabbits to another series of rabbits by intracerebral injection of the brain substance of the first series was successfully effected; there was practically no clinical reaction, but when the rabbits of the second series were killed, twenty-five days after inoculation, the same changes were found in the brain and meninges as in the first series.

Barker, L. F. SYMPTOMS IN EPIDEMIC ENCEPHALITIS. [Am. Arch. of Neur. and Psych., August 1921, VI, No. 2. J. A. M. A.]

The occurrence in a patient of (a) pathologic drowsiness (lethargy), (b) cerebral nerve paralysis (especially ophthalmoplegia), (c) an acutely developing Parkinsonian syndrome, (d) a cataleptic or a cata-tonic state, (e) myoclonia, (f) chorea, (g) pupillary disturbances, (h) violent neuralgia, (i) a poliomyelitic syndrome, (j) a peculiar delirium, (k) a psychotic state or (l) signs of meningeal irritation in times when encephalitis is epidemic, Barker says, should make one think of the possible existence of epidemic encephalitis.

Zannelli, P., and Santangelo, G. ETIOLOGY OF EPIDEMIC ENCEPHALITIS. [Ann. d'ig., 1921, XXXI, 467. Med. Sc.]

The authors have reached the following conclusions: (1) lethargic encephalitis is caused by a filter-passing virus not as yet morphologically defined; (2) the disease is transmissible to rabbits and guinea-pigs also by means of the cerebrospinal fluid and blood of infected patients; (3) the transmission to animals may be obtained by means of subdural, intra-peritoneal, intraocular inoculations, as well as through the submucous tissue of the nose, if the mucous membrane was previously artificially altered; (4) the encephalitic virus is transmissible in series; (5) animals of the same species are variously receptive; (6) the results of serial transmissions vary according to the virus used, its virulence being sometimes attenuated, sometimes increased by the passage from animal to animal. [C. d. Fano.]

Bok, S. T. CAUSE OF THE SOMNOLENCE IN LETHARGIC ENCEPHALITIS. [Nederlandsch Tijdschr. voor Geneeskunde, September 17, 1921, LXV, 1511.]

Bok discusses the cause of the somnolence so often seen in lethargic encephalitis. It has been shown that it is not due to internal hydro-cephalus from pressure on the Sylvian aqueduct. The assumption of a "sleep center" in this region does not explain it. Bok thinks that the physiology of sleep helps us to understand why the typical inflammatory focus in this disease so often causes somnolence when we remember the localization of this focus and the physiology of the central nervous system. The autotoxic theory of sleep was supposed to explain the unconsciousness of sleep, but the newer physiology points out that unconsciousness is not the only phenomenon of normal sleep. Most of the

organs show during sleep a very particular form of function. Bok cites the recent paper of Barbàra (R. Acad. delle Scienze Med. in Palermo, 1920). In sleep the katabolic processes of the thoracolumbar sympathetic system are in abeyance, while the anabolic, albumin-building processes are predominant so that chemical reserves of energy are accumulated. It is shown that in the condition of diminished sympathetic activity the functional state of every organ corresponds with its particular state during sleep (this holds good for the circulatory and respiratory organs, temperature, digestive organs and sphincters, eyes, voluntary muscles, sense organs, and urine). It is difficult to say whether this "asympathicoreflex" condition during sleep depends on a lowering of sympathetic activity or on a raising of parasympathetic activity or on a combination of both. As a rule we find an inflammatory focus in the floor of the third and fourth ventricles in fatal cases of lethargic encephalitis; now it is in these typical foci that the nuclei of the parasympathetic system (the bulbomesencephalic autonomic) are situated. A very intense inflammation may kill by paralyzing the parasympathetic system; a less intense one may exert a stimulating influence on it and so may depress the sympathetic functions and thus may give all the signs of Bok's "asympathicoreflex" condition. Therefore the typical lesion of lethargic encephalitis will, on account of its localization, give rise to the somatic signs of sleep. But, while the condition in lethargic encephalitis is similar to that of normal sleep, it differs from it in certain points, as in the absence of the active refreshing power of true sleep. Further, other stimulating conditions in this region of the brain can give somnolence, as in some cases of Wernicke's acute superior encephalitis, in an acute meningoencephalitis in the sylvian aqueduct as a sequel of a boiler explosion, and in a fatal case of a tubercle of this region, seen at the Valerius-plein Clinic of Amsterdam. [Leonard J. Kidd, London, England.]

Marie, P., and Lévy, G. ABORTIVE EPIDEMIC ENCEPHALITIS. [Bull. d. 1. Soc. Méd. des Hôpitaux, July 1921, XLV, No. 24. J. A. M. A.]

A clinical study paralleled by a number of others of an attack of epidemic encephalitis proceeding in two phases separated by a long intermission during which the woman was pregnant and had a healthy baby. The second and still persisting phase was marked by sialorrhea so intense that the woman can be traced by the track of saliva she leaves. The Parkinsonian syndrome indicates severe disturbance in the medulla oblongata. Marie and Lévy report four cases of epidemic encephalitis in which the Parkinsonian symptoms were restricted to one arm. Souques has witnessed hemiplegia develop from this shaking palsy of one arm. Sicard mentioned that he had never seen a case of shaking palsy recover when the thumb and forefinger presented the "cigarette-rolling" sign. As long as this *signe de l'émiettement* is absent, improvement may be hoped for.

Meleny, H. E. DEGENERATION GRANULES IN BRAIN-CELLS IN EPIDEMIC ENCEPHALITIS. [Am. Arch. Neurol. and Psych., 1921, V, 147. Med. Sc.]

In the routine examination of sections from the brain of a case of epidemic encephalitis, minute granules were observed by Meleny in degenerative nerve-cells from areas affected by the disease. These granules are best shown in pieces of tissue fixed in Zenker's or Helly's fluid, embedded in paraffin and stained with eosin-methylene blue or by Bensley's modification of Altmann's method. To demonstrate them with eosin the author recommends a mixture of equal parts of strong alcoholic and 5 per cent watery eosin solutions staining forty-five minutes at 56° C. Demonstrated by these stains the granules appear as minute spherical masses, measuring from 0.5 to 2 μ in diameter, sharply outlined and highly refractile. The largest ones are nearly half as large as the nucleoli found in the same nerve-cells and often have a minute colorless center as though the stain had not thoroughly penetrated. They also are frequently surrounded by a clear zone in the cell cytoplasm. Their number appears to have no relation to the degree of degeneration of the nerve-cell. Frequently only a single granule is found in a cell, while other cells, the appearance of which is no more abnormal, contain forty or fifty granules. The degenerated cells are found only in areas in which there are other lesions characteristic of the disease. In the case of epidemic encephalitis investigated, the granules were found in the occipital cortex, the basal ganglia, the pons, and the medulla. In the spinal ganglion cells of the same case granules were found which gave the same staining reactions but were more irregular in outline, more numerous, and usually arranged in small rosettes. Sections from the central nervous system treated for five minutes with 10 or 20 per cent nitric acid showed the granules as brilliantly as before, whereas sections similarly treated with 5 per cent NaOH showed them hazily outlined and dull red in color. The granules are not specific of epidemic encephalitis as shown by their occurrence in the same situations in four cases of poliomyelitis, and in one of tuberculous meningitis associated with lymphocytic infiltration of the brain-stem. But they were not seen in cases which did not show an involvement of the central nervous system. According to Meleny the granules should therefore be considered as "some form of cytoplasmic degeneration." [C. da Fano.]

Bassoe, P. SEQUELS OF EPIDEMIC ENCEPHALITIS. [Wis. Med. Jour., November 1921, XX, No. 6.]

This author here calls attention to the following of the more frequent after-effects of an encephalitis attack: (1) The paralysis agitans syndrome, unilateral or bilateral, stationary, regressive or slowly progressive, sometimes combined with neurasthenic or psychotic symptoms; (2) cases with prolonged psychoneurotic condition of marked hypochondriacal character; (3) a prolonged simple exhaustive state similar

to what is usually called neurasthenia; (4) hemiplegic types—not common and often mixed with other features; (5) persistent somnolence, and (6) persistent disturbance of innervation of muscles of the face and the jaw.

Boyd. SEQUELS OF EPIDEMIC ENCEPHALITIS. [Amer. Journ. Med. Sciences, August 1921.]

In an analysis of 31 cases the sequelae are commented upon. Complete recovery, he thinks, is uncommon except in mild cases. Some symptoms persist in modified form. New symptoms appear as true after-effects in other cases. Marked general asthenia lasting for many months, headache usually occipital, altered temperament and delusions, and occasionally a persisting apathy and torpor, are among the general symptoms; while among paretic symptoms are evidences of prolonged cranial nerve involvement, diplopia and weakness of accommodation. Motor disorders of the nature of spasms, automatic, athetoid, and choreiform movements, may persist or arise many months after the initial attack, as also examples of the Parkinsonian type, with the clinical picture of paralysis agitans without the characteristic tremor. Such sequelae are the result of an inflammatory process mainly of the interstitial tissue and extending into the surrounding brain substance, the resulting fibrosis interfering with nerve paths. From the microscopic findings in any large series of cases it is surprising that after-effects are comparatively rare to any marked degree, but further observations on the condition of the brain in encephalitis after a considerable interval has elapsed are necessary to throw fresh light upon the clinical manifestations and their underlying pathological changes.

Falzi, O. SEQUELAE OF EPIDEMIC ENCEPHALITIS. [Policlinico, September 1921, XXVIII, No. 38.]

Ten cases of slow and progressive development of Parkinsonian syndrome following epidemic encephalitis are here discussed. The patients were all adults. All types of therapy were inefficacious.

Bastai, P. VIRUS OBTAINED FROM SOME CASES OF EPIDEMIC ENCEPHALITIS. [Boll. d. Ist. Sieroterap. Milanese, 1921, II, 197. Med. Sc.]

Reference has already been made to previous work of this author on the same subject (Medical Science, 1920-21, III, 560). He now reports that he has been able to isolate from another case of epidemic encephalitis a virus morphologically, culturally, and biologically similar to that obtained in 1920. The new virus was slightly virulent for monkeys, though one macaque became affected by a malady essentially corresponding to lethargic encephalitis. Rabbits appeared to be much more sensitive and could be infected by intratesticular, intraocular, and intranervous (central and peripheral) inoculations. The intraocular inoculations consisted either of injections into the anterior chamber or of

simple corneal scarifications. In this last case a keratitis of changing severity was obtained. When this was followed by the death of the animals the virus could be reinoculated from the blood and brain. A fatal infection of rabbits could, in some cases, be brought about also by scarification of the skins. [C. da Fano.]

Waardenburg. OPTIC NERVE INVOLVEMENT IN LETHARGIC ENCEPHALITIS. [Nederl. Tijdschr. v. Geneesk., July 23, 1921.]

The author comments on the earlier dicta that whereas the oculomotor was involved the retina was intact in epidemic encephalitis. This is not so. Subsequent investigations, however, showed the incorrectness of this view. Thus both Economo and Bartels observed a slight retrobulbar neuritis and a commencement of optic atrophy. Kennedy and Jelliffe reported such conditions in American cases. Oberndorfer saw a mild case of optic neuritis among eight patients with lethargic encephalitis; Hiram Woods saw one example of optic neuritis among six cases of the disease, and Schumway also saw one case. Waardenburg himself has observed one case characterized by a scotoma, indicating a retrobulbar neuritis, and another with a slight peripheral narrowing of the visual field.

Pontano and Trenti. EPIDEMIC HICCUGH. [Il Policlinico, August 29, 1921.]

In Rome in December 1919 a small epidemic of hiccough took place. This author inoculated 12 volunteers by subcutaneous injection of the whole and filtered blood, cerebrospinal fluid, and pharyngeal washings from four patients with epidemic hiccough but free from any other disease, and with a negative Wassermann reaction. The results were negative in each case. No bad effects occurred apart from sever local pain and redness of the skin, caused by injection of the pharyngeal washings. None of the persons inoculated, who were kept under observation for an average period of a month, showed any rise of temperature nor any symptoms which could be attributed to the disease in question. The writers reviewed the literature and came to the conclusion that epidemic hiccough does not constitute a form of epidemic encephalitis or influenza, and that it does not even have close epidemiological or clinical relations with it.

Moore, C. U. LETHARGIC ENCEPHALITIS IN CHILDREN. [Northwest Medicine, July 1921, XX, No. 7.]

In this clinical study 28 cases are analyzed. One-third of the cases only had lethargy and 22 patients were somnolent in type. An evident respiratory illness was antecedent in two-thirds of the cases. There was a 20 per cent mortality and complete recovery in 13 cases, or 46 per cent. A six weeks old baby was the youngest case.

BOOK REVIEWS

Allers, Rudolf. UEBER PSYCHOANALYSE. [S. Karger, Berlin.]

In 1920 the Society for Practical Psychopathology and Psychology of Vienna held a symposium on psychoanalysis. Allers and Schilder were the chief exponents for the objectors and partisans respectively. A large and representative discussion took place. This monograph presents the entire matter in detailed form. We would like to present it to our readers but as Dr. Adolf Meyer and F. J. Wertheimer have submitted the study to a very extensive (11 pages) and extremely well balanced review in the May, 1923, issue of the *Am. Archives of Neurology and Psychiatry* we would like to refer those interested to this exceptionally valuable résumé in lieu of presenting one ourselves.

Dunlap, Knight. THE ELEMENTS OF SCIENTIFIC PSYCHOLOGY. [C. V. Mosby Company.]

This is a far better achievement than we had expected from the author's previous affective outbursts in the psychological sphere. Although there still peep through the trends that "my doxy is orthodoxy," what I teach is "scientific," this egotistical attitude is not so offensive as in previous efforts of the author to hold up the "heterodoxy" of others to ridicule. Apparently he has steadied his horses and commenced to pay attention to things concerning which he has some insight and has not attempted to labor to pluck the "mote" out of others' eyes.

Thus he would here confine his efforts to prepare a book which is "designed to introduce the student to the elements of psychology and to give him a firm ground on which to build" a structure dealing with the general problems of psychology.

We recognize that many important needs come within the psychological domain; nay more, the general problems of life which need psychological insight transcend, in their larger issues, almost all other intellectual disciplines. It is absolutely impossible to compass all of the related fields and Dunlap emphasizes this difficulty. He therefore wisely restricts himself to the effort of laying down "principles" and inhibits his trend to stray into other domains which annoy and irritate him.

"Convenience" suggests the divisions into (1) "Adult Human Psychology," (2) "Child Psychology," (3) "Animal Psychology," (4) "Social Psychology." This for *him* is "*the*" most convenient for "*practical*" purposes.

Why in confessing it is not an "accurate" or a "logical" mode of approach (p. 15) and still call it "practical" we shall not attempt to

reconcile. Certainly his own argument, in his introduction, leaves us in the lurch. But this is really immaterial as this same Introduction is not without its interest and value, even if apologetic. When he says the "soul" concept is no longer used in psychology, Bleuler's recent (1922) masterly treatise on "Die Naturgeschichte der Seele", "An elementary Psychology", stares us in the face and causes us to ponder.

In fact so many minor irritating *ipse dixits* are scattered throughout the entire book that we suspect that the author's insistence on his adjective "*scientific*" is nothing but a huge rationalization. "Mind is here conceived as the totality of *conscious* adjustments." This is a puerile conception, and Dunlap does not help us out. He contradicts himself copiously. So much for the Introduction.

The major body of the book follows in the main the physiological psychology of Wundt, Ladd and their general type. We say "follows" advisedly. He elaborates, *i.e.*, incorporates newer instructions, but almost never synthesizes. His mode is purely intellectualistic, absolutistic, dogmatic; behind the multiplicity of manifestations he usually *counts*, but rarely ever *measures*. He is academic, pedagogic, anatomic; his forte is never essentially empathic, understanding, nor functional. He loves such *terms* as rhigotic, thalpotic, algetic, although simple English equivalents are available and more practically utilizable. These are not isolated examples of this pedagogic euphoria for "pseudoscientific" precisions; the book scintillates with these short circuits of static concepts and dogmatic judgments. It matters little that the conciliatory phrase, "these are still matters of discussion," is freely sprinkled throughout the book. In phantasy Dunlap is assiduously cutting these Gordian knots and tells us the "truth" about these debatable matters.

It would be a gross distortion to say that this very useful work is unsafe as a guide to students. It is full of valuable material. It evidences much sincere effort and conscientious endeavor and is a valuable contribution to a field of inexhaustible complexities, but our general judgment is that it is extremely dogmatic. It has little "soul" but a prodigious "body." We are tempted to describe it as Nietzsche does in Zarathustra "On Salvation," as a "reverse cripple." "One who knows too much about one thing and nothing about many others."

Elliot, Hugh. HUMAN CHARACTER. [Longmans, Green and Co., London and New York.]

The author wisely reminds us of the numerous unsuccessful efforts that have ceaselessly been made to define character and personality. J. J. Rousseau is held forth as one of the most gifted, yet he failed and our author gives the names of a number of others.

His own effort is scrambled with the following items of general features. Major Passions such as Egoism, Love, Social and Moral Feeling, Jealousy and Religion; Minor Emotions, such as Thought, Action, Belief, Bovaryism, Suggestion, Obsessions, Fanaticism, and

Genius. Vice and Crime, Disease, Youth and Old Age, Body and Mind, Heredity and Environment are additional chapters in this general potpourri.

It may be seen that the so-called newer or dynamic psychology is prominent by its absence. Whether this omission is due to accident or design cannot be gathered. At all events in so far as the numerous previous attempts led us nowhere, and the present one is no better than the others, it might be worth while for writers on personality to see what the serious workers in neuropsychiatry have to offer towards a better understanding of this problem. By reason of its pleasing style the book justifies its existence possibly; certainly it is instructive, but as Goethe of old would have hated it because it merely instructed but did not quicken one's imagination, so it fails because of its reiteration of the old with little or no leaven from the new.

Rogues de Fursac, J. MANUEL DE PSYCHIATRIE. Sixieme Edition.
[Felix Alcan, Paris.]

American readers are fairly well acquainted with de Fursac's manual as it has been before them in translation a number of years. It can fairly be said to be the outstanding small manual of mental diseases in the French language. Furthermore, its general mode of treatment has been well received as this author was among the first to recognize the high descriptive merit of Kraepelin and was the first real French author to embody Kraepelin's clinical trends in his treatise.

At the same time he has not progressed much beyond this descriptive psychiatry and although this sixth edition is an excellent revision and augmentation it contains little of the newer and stimulating material made possible by the dynamic psychology of Bleuler and other well known psychiatrists.

One may willingly admit that such material has not been sufficiently integrated to serve as sound principles for radical rearrangement of the major portions of the neuropsychiatric field but in those regions where radical advances have been made as in the neuroses and psychoneuroses, these newer attitudes are not advantageously utilized in this otherwise most excellent volume.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

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